Comparative Environmental Regulation in the United States and Russia

Institutions, Flexible Instruments, and Governance

Lada V. Kochtcheeva

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To Vyacheslav A. Kochtcheev and Tatyana L. Kochtcheeva,
my parents, friends, mentors

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Preface

In the past decade, the notion of "governance" has become a major issue in public policy and comparative and international institutional analysis in many countries of the world. It embodies the character and capacity of governmental decision-making and the relationship that governments have with the communities they govern through the development of public policies. How effective are current public policies? Which levers need to be pulled to make a policy work? How do political institutions and organizations of society act in their capacity to shape and influence public policy? This book explores how policy actors in the United States and Russia generate new modes of interaction by designing and adopting flexible incentive-based instruments for environmental protection. The argument emphasizes the importance of political and institutional contexts in a comparative institutional and historical perspective. Specifically, it highlights preexisting institutions and policies that shape potentials for the introduction of flexible environmental policy tools. The book simultaneously addresses the processes and attributes of good governance. The development of new environmental policy approaches stands at the concurrence of contemporary worldwide devolution and decentralization trends and the rise of commitments to improve effectiveness, accountability, and institutional capacity.

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CHAPTER 1

Environmental Protection through Flexible Regulation

Over the last three decades, environmental policy became important for almost all countries in the world: industrialized democracies, post-Soviet countries, and developing nations. At the same time, the challenges to political, economic, and ecological sustainability have raised significant questions over what would constitute a good policy and what would be the best strategies to achieve environmental goals. Traditional approaches to pollution control, such as direct regulations, prohibitions, and standards, have brought about considerable achievements in environmental quality, but now are more difficult and expensive to apply (Braadbaart 1998; Richards 2000; Helm 2000; Stavins 2000; Desai 2002; Dietz and Stern 2002; Sterner 2003). The political atmosphere has also changed in many countries in ways that encourage governments to apply more effective, noncoercive, and efficient instruments of environmental policy. Why then do governments still heavily rely on the use of direct regulation? Or, alternatively, what makes governments introduce incentive-based flexible[1] instruments? While innovative flexible methods are very attractive, cost-effectiveness and technical rationality are often at odds with political goals and policy traditions. When governments make decisions about the adoption of alternative policy approaches, they pay more attention to institutional resources and the emerging demands of a political system than merely cost-effectiveness or efficiency of new instruments. Policy instrument choices depend on the continuity with legal and regulatory traditions, the nature of environmental policy authority, the types of established regulations, and the capacity of government to ensure compliance with pollution control policies.

This book highlights political and policy preconditions for the replacement of command-and-control systems with flexible instruments such

as incentive programs, tradable permits, pollution charges, eco-audits, and voluntary agreements. It examines the shift to new modes of regulation and new methods of governmental action. It does so by analyzing the introduction of flexible laws and regulations in air and water quality policies in two large federal states—the United States and the Russian Federation—from the 1960s to the present. These countries were very different ideologically, socially, and economically, especially during the Soviet period, but there are important similarities between them. Large, industrialized, federal states tend to employ analogous regulatory principles in environmental policy, that is, respond similarly to similar problems. Both countries initially used health- and technology-based standards and prohibitions for pollution control, and both countries have been moving toward flexible instruments in policy over a long period of time. The U.S. and Russian cases also reveal that in complex federal bureaucratic societies not all aspects of policy decisions are resolved in the legislatures. In both countries, regulatory agencies take initiatives in introducing flexible instruments, such as pollution trading and fees, and initiating policy changes in the legislatures. Both countries also use incentive-based instruments only as supplements to existing systems of command and control regulations, which ensure enforcement of pollution control requirements.

The important differences in the introduction of incentive-based instruments reveal themselves in the timing, scope, and type of flexible tools in the two countries. The United States focused on various forms of pollution trading early on, while Russia relied on moral suasion and later chose pollution fees and charges based on a complex scheme of standards. Answering the question of what explains these differences—when and how one set of instruments or the other is adopted—becomes important. It is important in its own right, and is also important because more accurate analysis of the comparative benefits of flexible versus command-and-control instruments requires addressing an underlying endogeneity question. If flexible instruments can only be adopted in policy contexts that differ systematically from those in which command-and-control instruments can be adopted, then the benefits that are attributed to flexible tools may derive from a political context that is more conducive to regulatory reform. Comparing the introduction of flexible tools in the countries that have differences in the fundamental political and socioeconomic contexts allows explicating those policy and political contexts and factors that are either favorable or detrimental to policy innovation. For instance, countries with comprehensive and independent environmental agencies are better able to introduce policy innovations than countries in which a pollution control authority possesses very little autonomy or is fragmented or dispersed.

This comparison goes beyond the immediate scope of explaining the adoption of flexible instruments in the United States and Russia. The institutional approach adopted in this study has implications for designing innovative incentive-based approaches in different countries of the world and in different policy areas. Developing countries and transition economies, which undergo rapid industrialization and a transformation to economic and political participation, have expressed interest in applying incentive-based policies for pollution control. The analysis of practical experiences with flexible tools in the United States and Russia reveals that the institutional framework and policy practices of a country play a crucial role in structuring the incentives, options, and constraints faced by policy actors. The institutional framework ultimately shapes the conditions and process of policy instrument adoption, which in turn suggest the extent and success of introducing flexible approaches. Institutional legacies and policy traditions of different countries vary but they orchestrate the way policy and decision-makers experiment with innovative approaches. The political and institutional framework of a country shapes the potential for success or failure of adopting incentive-based flexible approaches.

Analyzing policy choices in the area of environmental protection and pollution control is crucial, as a large array of policies impinge on it, including natural resource management, property rights, taxes, subsidies, credit, and so on. Many countries introduce user charges in such sectors as energy, water and waste management with an incentive effect for pollution reduction in mind. The adoption of incentive-based instruments in environmental policy also provides insights about the introduction of flexible policy instruments in other policy areas. Incentives, such as subsidies, tax credits, and exemptions in the transport, energy, and agriculture sectors, are used in many countries. Not all of these instruments are both economically viable and environmentally friendly. The feasibility of flexible approaches that contribute to environmental sustainability in these sectors may derive from the experiences with incentive-based tools in environmental policy itself. While there is no blanket solution for all policy areas, relevant practices with environmental policy tools propose an analytically useful framework within which policy actors can initiate and develop appropriate tools for their respective policy fields.

Understanding what causes a shift from direct regulation to incentive-based instruments addresses more general underlying questions of why specific policy approaches and the principles they represent find their ways into public policy. There is a worldwide movement toward devolution, decentralization, and the use of innovative approaches in public policy. The choice of policy instruments—achieving desirable results efficiently in terms

of policy frameworks—becomes fundamentally a function of governance criteria. This involves various actors, from national government to regional and local administrations, to society, and economy, in both the design and implementation of policy. Specifically, environmental governance signifies efforts by the state to share its governing capacity through the creation of incentives and voluntary schemes for the regulated community to reduce its negative environmental impacts. The development of policy approaches that lead to policy power-sharing suggests increased attention to policy legitimacy, effectiveness, and accountability.

This introductory chapter acquaints the reader with substantive and theoretical foundations that the balance of the book uses in analyzing whether and when governments adopt flexible policy instruments for environmental protection. It outlines the goals for understanding the institutional capacity and dynamism, types of policy instruments, and new modes of governmental intervention. It initiates a conceptual framework that informs the argument about the adoption of flexible instruments, sets out the research strategy, and presents the plan of the book.

POLICY INSTRUMENTS AS GOVERNANCE MECHANISMS

The arguments put forward in this book are informed and inspired by the debates regarding the problems of effective governance. Governance, understood as the emergence and recognition of principles, rules, and procedures, provides standards of acceptable public behavior that are followed to generate behavioral regularities (Nye and Donahue 2000). Governance refers to both the nature and capacity of governmental institutions and to the relationship that governments develop with the communities that they govern through the development of public policies in general and individual instruments of intervention in particular. Exploring how policies are formed and how policy actors generate new instruments and modes of interaction is inextricably bound to explaining the institutional configurations, political action, and policy contexts.

The study of policy instrument development should ideally achieve three following goals. First, the study should enhance our understanding of governmental institutions, their capacities, and modes of governmental regulation. As Maarten Arensten (1998) claims, the main goal of policy making is to develop policy tools. Government actions take on the form of remedial interventions in economic and social life. Various policy instruments with distinctive features are applied in a policy implementation process to realize the goals stated in policies, which in turn results in policy outcomes. Because governmental activity is identified with different forms and degrees

of intervention, different policies can be represented analytically as various instruments (Linder and Peters 1998). The ways public authorities choose policy tools to "purposefully influence societal process"[2] (Bruijn and Hufen 1998, 11) also tend to reflect the institutional background of specific political contexts and the traditions of regulatory development. This knowledge about instruments, their characteristics, and the contexts in which they are used can disclose government's purposes, capacities, and accomplishments.

Second, the study should specifically improve understanding of the applicability, choice, and effectiveness of environmental policy tools. One consistent statement from environmental economics is that flexible instruments are promising alternatives to direct regulation. The expectation is that economic incentive-based instruments or market-based tools are a more preferable and cost-effective option to achieve environmental policy goals than traditional policy instruments, such as directives and prohibitions, also called command-and-control tools (Baumol and Oates 1979; 1988; Richards 2000; Helm 2000; Stavins 2000). Because polluters face heterogeneous abatement costs, flexible economic instruments leave polluters free to respond to a stimuli provided by the government in a way that they think is more beneficial (Bradbaart 1998).

Economic flexible tools give the choice to the regulated entities on how to comply with environmental standards. They, nevertheless, require significant efforts on the part of government to calculate the level of marginal damage and marginal abatement costs and avoid the distortion of initial motivation to establish an environmental tax base and rate. For example, environmental tax rates frequently are set to satisfy fiscal requirements, and not according to a valuation of environmental damage (Andersen 2000). This produces the opposition to eco-charges by environmental groups, which are skeptical of this sort of revenue collection. Businesses may also oppose charges because they fear immediate costs, despite greater efficiency of such instruments (Buchanan and Tullock 1975). To increase flexibility, applicability, and viability of policy approaches, governments consider and experiment with other incentive-based instruments, which serve as supplements to both direct regulation and economic tools. Among them are informational tools, voluntary agreements, environmental audit and expertise, and reflexive law (Sterner 2003; Orts 1995; Bemelmans-Videc et al. 1998; Tietenberg et al. 1999; Dietz and Stern 2002). Understanding the art and craft of developing and combining these tools is the focus of this book.

Finally, this book goes beyond the study of policy instrument attributes, such as cost-effectiveness, to focus on political and institutional forces impacting the evolution of policy tools and, ultimately, the methods of governance. The notions of cost-effectiveness and efficiency dominate the discourse on flexible policy tools, especially among environmental economists (Baumol

and Oates 1988; Helm 2000; Sterner 2003). They demonstrate that flexible instruments would bring about the desired level of environmental abatement at a lower cost and encourage innovation (Andersen and Sprenger 2000; Harrington and Morgenstern 2004). Because flexible instruments are incentives rather than mandates, they also give the targets the freedom to choose and adapt their activities. However, effectiveness and efficiency are not the only criteria that governments take into consideration in the real world. The background of policy and regulatory realities that represent the compromises of the past among multiple policy actors permit or preclude reforms on policy approaches and tools. As Hans Bressers and Dave Huitema (2000, 67) claim: "This is not a question of "good science" versus "bad politics," but a recognition of the fact that politics has rationality of its own."

Many elegant and attractive arguments about flexible instruments face a problem of political and institutional feasibility when assuming that polluters will behave according to the mathematical models, and that rules will be automatically enforced by frictionless bureaucracy. When a theory of incentives versus direct regulations compares ideal characteristics of flexible instruments with the real performance of direct regulations it throws away the most problematic element of policy—public policy making and administration process (Braadbaart 1998; Andersen 1994, 2000). In order to introduce any cost-effective solution, such as environmental charges or trading permits, political and administrative decisions need to be taken about the tax base, the linkage between policy instruments, as well as about assurance that environmental goals are met. A transition to flexible regulations is not a mere change in policy tools. It signifies the changing nature of governmental intervention and requires innovation that derives from extant institutional reality and is based on a complex scheme of actions, as well as on realistic expectations and understanding the instrumentalities of attaining better governance.

INSTITUTIONS MATTER

A conceptual framework, which provides a context for analyzing policy processes and drives the argument, is essential if the development of policy approaches is to be understood. Such a framework will make sense of complex and often hectic policy making and implementation processes as well as permit improved conceptualization and the integration of findings into the wider literature. In building an adequate framework, decisions have to be made about the scope of analysis and the best way of depicting the dynamics that drive policy change. A policy framework within which instruments are adopted comprises several fundamental elements and potential explanations, including economic, sociocultural, political, and institutional variables.

According to the economic perspective, businesses themselves demand the introduction of incentive-based flexible instruments, especially market-based tools. Enterprises tend to prefer instruments that would provide more flexibility and lower aggregate costs for the industry as a whole (Buchanan and Tullock 1975; Hahn 1989). Flexible market-based approaches are more cost-effective than direct regulation, but, in many cases, they are most cost-effective in relation to the costs to society. They may vary in proportion to costs imposed on enterprises. The use of market instruments does not always guarantee that industry's compliance costs will be less than the compliance costs of direct regulation. Moreover, direct controls usually allow a certain degree of leeway for industries through negotiations with a regulatory agency or court appeals (Baumol and Oates 1979). It would follow that industry may even oppose market instruments if the latter require immediate increase in costs, or enterprises may prefer those tools that minimize financial burdens placed on industry (Keohane et al. 1998). Cost-effectiveness as an attribute of instruments themselves is not necessarily the major concern for industries. Even when economic flexible instruments do not entail visible extra costs for industry and when industry pressures governments to introduce flexible economic tools, governmental agents have to act under institutional constraints. Governments will have to account for distribution effects, the possibility of adaptation to existing regulations, and general implementability of the instrument. What is needed then is a framework that is sensitive to the preferences of economic and governmental actors and to the institutional constraints facing them.

An explanation of the adoption of flexible instruments that emphasizes the role of interest groups in influencing policy change and determining policy approaches is certainly a possibility. Consistent with the interest representation perspective, the adoption of policy instruments depends on inputs from various interests and how these interests are organized (Crepaz 1995). Interest groups may support or oppose certain policy tools that they perceive to be beneficial/detrimental for their own purposes or general societal concerns. Many environmental groups favor direct regulations, uniform standards, and strict deadlines to control pollution; many business interests seek to promote flexible standards and economic incentives (Bailey 1998). In some instances, however, business groups advocate uniform pollution standards and environmental groups support flexible approaches. The U.S. auto producers advocated national air pollution standards in the 1960s, while some major environmental groups welcomed emissions trading in 1990. The ability of interest groups to influence the development of policy tools depends on the timing and access of groups to formal political institutions, the political opportunity structure, and the relationship of groups with the government. To account for these facts, an explanation is needed that acknowledges that political and policy factors beyond interest groups shape the process of instrument adoption.

Explanations of instruments choice based on a sociocultural perspective can help to account for the determinants of policy change. The sociocultural framework argues that ideas, beliefs, and cultural experiences shape the way policy instruments are adopted (Linder and Peters 1989). Introduction of instruments may represent a type of socially constructed processes whose value and meaning are reconstituted over time (Steinberger 1980). On the one hand, such an approach admits as relevant the beliefs and perceptions of the actors involved in instrument choice. On the other hand, we can expect interpretations of an instrument and its context to be embedded in and vary according to the source. It would reflect values that are at least in part related to more easily identifiable factors, such as professional training or affiliation with a particular governmental body. The training and experience of policy makers and regulators may make them more comfortable with one type of policy instrument rather than another. The experience of different countries with various policy tools demonstrates an incremental character of instrument development. This may mean that either policy actors' perceptions and beliefs do not change fast, or that there is not enough influx of people with different training or beliefs, or that existing institutional framework and regulatory traditions affect the pace of policy development. The danger will lie in the failure to recognize that government institutions endow various policy actors, and specifically government officials, with properties that allow or preclude change in policy approaches.

Recognition that government institutions and a path of regulatory development are central to the choice of policy approaches is essential if a plausible explanation of the instrument adoption is to be produced. An explanation of the type, scope, and timing of the introduction of flexible tools that is centered on institutions is able to provide the attention to political and policy dynamics that is lacking in other frameworks. Policy instrument adoption, although in many cases influenced by multiple stakeholders, cultural, ideological, and external factors, involves a fundamental choice on the part of the government. The focus of this book is on governmental institutions and policy structures that ultimately influence the interests of nongovernmental actors and structure the external forces, as well as react and make policy priorities based on the inputs from actors outside the government. The important emphasis is given to institutional dynamism and its consequences for policy instrument choice. A conceptual framework that treats institutions as static and closed entities would be incomplete. It is important, then, to look at the location and nature of governmental institutions, assess established institutional practices, and analyze their contexts and capacities over time to explain the introduction of flexible instruments.

INSTITUTIONAL FACTORS AND FLEXIBLE TOOLS

This book starts with the premise that flexible environmental policy instruments can improve policy implementation and bring about further improvements in environmental quality. It also claims that the introduction of flexible incentive-based tools is not straightforward. A record of different countries demonstrates that governments, even having realized the advantages of flexible instruments, do not always choose them because governmental actors operate in a political system and are constrained by institutionalized practices and policy traditions (North 1989; Jänicke 1992; Dryzek 1997; Andersen 2000). This book's analysis of almost fifty years of experience with environmental policy approaches in the United States and Russia demonstrates that the choice and design of policy instruments are heavily reliant on the distribution of political power and on the established institutional framework of a country. Throughout the book, I argue that the path of institutional change shapes the evolution of policy instruments and is influenced by constraints resulting from the past and the consequences of numerous incremental choices of policy actors, which frequently alter these constraints.

The argument has four major points. First, the adoption of policy instruments is not simply deduced from the attributes of instruments, but is conditioned by policy contexts in general, and specific institutional practices in particular. In the words of Majone (1989, 5), "laws, regulations, norms, organizations and decision-making procedures" serve as institutional constraints for the adoption of flexible instruments. Second, policy choices made in the past affect the availability of future options. Established practices put a check on the introduction of new policy tools and new government strategies. These established institutions may serve as constraints if new policy instruments challenge the standard operating practices, or they may serve as channels for policy innovation if new tools are adopted along the lines of regulations and practices that are already in place. Third, flexible instruments are a part of a regulatory toolbox. They are only supplements to existing rules and regulations. Flexible tools do not replace regulations, which remain in place to provide assurance that policy goals are met. Fourth, the introduction of flexible instruments suggests a shift toward new modes of governmental action. It assumes policy formation and implementaton that generate incentives and focus on desired outcomes by providing economic and societal actors with greater flexibility for responding to policy concerns and encouraging innovation.

The choice and development of policy instruments are not "free" (Ringeling in Bagchus 1998). The ways in which political institutions,

structures, and capacities work can help explain policy instrument adoption. The theoretical framework and the cases analyzed in this book suggest specific propositions regarding the institutional and political factors that shape the process of adopting flexible instruments. These factors are the nature of environmental policy authority, the initiatives of administrative agencies, the type of extant regulations, accountability measures, and a level of burden for administrative agencies.

Flexible approaches are more likely to be established and sustained when a comprehensive, independent, and centralized environmental agency provides for guidance, coordination, and consistency in policy choices. Centralization and concentration of policy authority are appealing as a means to secure effectiveness, performance, and goal achievement. Centralized authority is also conducive to policy consistency: a consistency not only between the legislative intent and implementative standards, but also among the specific policy decisions built on those standards (Lundqvist 1980). While centralization of authority may be seen as an attribute of direct regulation, and decentralization, on the other hand, as a vehicle for competition and innovation, the uneven character of policy innovation and change remains a constant concern for policy makers in federal systems (Rabe 2000). Environmental problems are transboundary in nature, and to the extent that a state or a region covers more than one jurisdiction, the authorities should maintain some consistency in key design elements of the program. To ensure that policy provisions are consistent and fungible across jurisdictions, flexible tools require common design elements, including standards for determining applicability, pollution measurement and reporting, and enforcement (U.S. EPA 2003a). In addition, placing environmental responsibilities in an independent agency prevents the fragmentation of environmental authority among agencies with the goals of commodity development, thus precluding a conflict of interests. This in turn creates an institutional foundation for addressing a whole range of environmental concerns and developing tools to cope with pollution. The attention given to a comprehensive environmental policy authority does not deny the trends toward devolution, but rather advances understanding of the patterns of policy development.

In the United States, a fundamental structural achievement at the dawn of the environmental era was the establishment of a centralized administrative apparatus, the Environmental Protection Agency. Centralization of policy authority was seen as contributing to policy consistency, where the agency provided states with guidance, technical, and regulatory assistance. Concentration of policy authority in the EPA resulted in significant leadership of the agency to introduce multiple innovative tools. It was the EPA that developed emissions trading schemes and guided states through the establishment of trading approaches in the State Implementation Plans.

Where the states find it difficult to cope with the direct regulation, the federal government's greater insulation from powerful local interests gives it the opportunity for leadership.

A major structural obstacle that Russia inherited from the Soviet Union is the fragmentation of administrative responsibilities and constant bureaucratic reorganization. While centralization of authority is still a considerable tendency, a lack of a strong and independent federal environmental agency and a duplication of functions among regional agencies contribute to the difficulty of using incentive-based tools. The system of pollution charges, however, was put in place by a central federal agency, the State Committee on Environment, while it was still in existence.

The introduction of flexible instruments also depends on the initiative of regulatory agencies. Regulatory agencies can initiate a legislative response, take part in creating policy provisions, and, consequently, instruct a change in policy. The traditional dichotomy of "policy" and "administration" is challenged by the fact that regulatory agencies do not only carry out clearly understood directives from the legislature but also independently shape those directives and exercise discretionary policy authority while translating the intentions of statutes into specific government actions (Harmon and Mayer 1986; Frederickson and Smith 2003). Because administrative agencies routinely advocate values and decide who gets what, when, and how, administration is viewed as a highly independent force shaping political decisions (Waldo 1948; Meier 1993).

Environmental regulatory practice, rich with political implications, shapes the impact of regulation as much as the formal language of law. The task demands of pollution control increase bureaucracy's influence in a policy process. Agencies armed with a variety of enforcement options are in the position to select those options they believe will best achieve their purposes. Moreover, regulators seek voluntary compliance. They want to avoid penalties as a means of ensuring compliance because resorting to administrative or judicial proceedings will create a protracted, inflexible process with no assurances that polluters will be compelled to control emissions speedily and efficiently (Rosenbaum 2002). The use of regulatory discretion over pollution control and prevention may allow regulatory agencies to achieve more pollution abatement than would be in the case if they insisted on stringent controls and immediate compliance.

In the United States, the EPA shaped the process of adopting flexible tools. Emissions trading, voluntary pilot projects, audit, and self-disclosure policies came out of the EPA's daily struggles. Congress and courts established the outer limits of possibility, but the decisions that make a difference to those concerned with the outcome were made by the agency. In water quality policy specifically, stifled by the rigid technology requirements of the law,

the EPA and state agencies still experimented with and designed a system of variances and water pollution trading to alleviate the administrative burdens and burdens placed onto different categories of industries.

In Russia, the introduction of incentive-based instruments belongs to multiple regulatory agencies, including an environmental regulatory authority, as well as some initiatives of resource utilization ministries and departments. A complete agreement on a scheme for pollution charges is difficult due to the fragmentation of policy authority and a relative lack of aggressiveness from the Ministry of Natural Resources, which allegedly should provide leadership in establishing flexible regulations.

The evidence most strongly indicates that flexible instruments that do not require a fundamental reorganization of the regulatory practices that are already in place are much more easily introduced and accepted. This suggests that new flexible instruments should be based on or implanted into the existing framework of regulation, and they should not place many additional burdens on regulatory and administrative processes. Direct regulation provides standards for behavior and a strategy directed at many. Regulatory agencies and the regulated communities routinely work with, apply, and enforce regulations. The adoption of flexible tools requires their institutionalization. New instruments have to be based on common understandings, rules, and procedures. They have to satisfy standards of fairness, certainty, and procedural justice, which require administration and monitoring (Mann 1982). The type of a regulatory framework and existing standards bear a significant influence on the type of new flexible instruments. As Robert Hahn (1989, 107) argues: "Virtually all environmental regulatory systems using charges and marketable permits rely on the existing permit systems. Most of these approaches were not implemented from scratch; rather, they were grafted onto regulatory systems in which permits and standards play a dominant role."

Creating and legitimizing new instruments require the evaluation of compatibility with existing standards and operating procedures. Merely challenging the authority of existing instruments is not sufficient for flexible instruments to become an integral part of regulatory structures. Flexible instruments are novel policy approaches that build on aspects of organization and legitimacy found in conventional regulatory practices. Such incremental policy change does not mean an impediment for better practices, but rather the process of "adjusting to new uncertainties by improvising on practice routines that new [approaches and tools] emerge" (Stark 1996, 995).

The U.S. EPA's innovation and reinvention strategies are usually designed within existing agency programs but are aimed at streamlining regulation and improving compliance. All flexible tools are evaluated against the existing regulatory framework, which allows or impedes the introduction

of new tools. Initial command-and-control air policies based on ambient quality standards and quantitative emission limits accommodated emissions trading. In water policy, however, prescriptive and design-based standards did not leave much space for innovation and flexibility. Only with a shift to performance-based standards could regulators turn their efforts to developing various techniques, including flexible instruments such as water quality trading. While direct regulatory programs are still a core of the U.S. environmental system, they are constantly augmented by new instruments to meet current and future societal demands.

The introduced system of pollution charges in Russia is also integrated into the existing system of emission limits in which maximum allowable levels of pollution were established, and permits issued for each enterprise. Calculations of charge rates and indices come from already established pollution limits for many enterprises and approved federal or regional environmental programs, which provide an incentive for the regulatory agencies to work with the charge system.

Politicians and regulators also want to have as much certainty about the place and pace of pollution reduction with flexible instruments as they believe they can achieve with direct controls. They want to ensure accountability of the new approaches by backing them with existing standards, requirements, and penalties. This helps explains why flexible instruments are introduced as supplements to command and control tools, but not as a complete replacement of direct regulation. Provisions for noncompliance create a framework of oversight and enforcement that will hold participants accountable for their activities and ensure compliance with the program's requirements, which creates a primary basis for accountability.

In the United States, penalties, fines, as well as civil and criminal liability for noncompliance are authorized by law as well as cemented in EPA regulations. These provisions in pollution trading schemes and multiple other flexible approaches add credibility to new tools of regulation. They also provide a constant evaluation base of the workability of flexible instruments and help ensure that environmental goals are met. The Russian system of emission charges also includes direct regulation requirements for noncompliance penalties and compensation for the damage to the environment. By aligning with law, preserving the system of enforcement, and indexing the charges based on volume and toxicity, regulators aim at ensuring that it is more expensive to pollute than to comply.

Flexible tools are rarely given a chance to operate by themselves, and yet they help provide more efficient incentive and choice-based ways for the regulated communities to comply with pollution control requirements. At the same time, regulatory agencies themselves want more efficient and flexible ways to achieve policy goals and manage their programs. The literature

on compliance in environmental law and regulation (Mitchell 1994; Brown Weiss and Jacobson 1998; Hatch 2005) advises that the problems of regulatory effectiveness suggest that the adoption of certain types of tools may improve the implementation of policies. The more difficult it is for regulators to fulfill environmental requirements with command-and-control, the more likely that they will experiment with alternative flexible approaches. In cases when a regulatory agency can identify a specific source of pollution or when a desired pollution level might be close to zero, applying direct regulation may be the most straightforward and most effective solution to the problem (Baumol and Oates 1979). In cases where command-and-control practice proves incapable of tackling environmental problems generated by its functioning, policy and decision-makers strive to improve implementation to achieve better environmental results. An impetus for adopting more efficient and effective practices comes from two sources. First is the acknowledgment of a persistent concern to which no existing strategies provide a satisfactory answer (Suchman 1995). Second is a desire of decision-makers to work within the framework of rules that promotes public acceptance and confidence in the instrument as well as aids regulatory agencies themselves in program design and implementation.

Introduction of flexible instruments in the United States has been aimed at increased cost-effectiveness of the programs, voluntary attitudes that build mutual understanding and trust, but also at reduction of implementation burdens by agencies. To ensure effective implementation of air and water quality programs, a variety of flexible instruments were initiated. In Russia, the difficulties of attaining established goals through traditional methods of simply requiring compliance with the strictest standards facilitated the introduction of pollution charges. The charges are aimed at providing incentives for polluters to reduce environmental damage and generate revenue to help pay for public environmental expenditure and support already established goal-oriented programs. The introduction of flexible regulations serves as an important mechanism for the enhancement of regulatory and administrative capabilities of agencies themselves.

The importance of institutional factors reveals itself in the way they shape the process of the introduction of flexible instruments. Innovative incentive-based instruments have a better chance to be adopted when a comprehensive environmental agency provides for coordination and consistency, where governmental regulations become a source of policy provisions, where flexible tools are grafted onto existing regulatory systems and improve implementation practices. The design and introduction of policy tools strongly depend on the location and nature of policy, the existing regulatory traditions, and administrative capacity for implementation.

COMPARATIVE INSTITUTIONAL RESEARCH: STRATEGIES, CASES, AND LIMITATIONS

Exploring how policies are formed and why policy actors generate new policy instruments is inextricably bound to explaining the institutional configurations and political and regulatory action. This requires highlighting the development of political and administrative institutional contexts in which policy struggles unfold. Contemporary comparative institutional research on environmental politics and policy presents an effective opportunity to uncover the modes of government intervention and the development of innovative approaches.

This book contributes to these research efforts by studying why, how, and when different governments pursue particular policy approaches. It employs a comparative institutional method to environmental policy research because, in the words of David Vogel (1987), such an approach can contribute substantially more to our understanding of different national styles in policy design and regulation, the significance of these differences, and their historical and institutional roots of policy changes. A comparison is an especially valuable tool because the goal of this book is to investigate not only what policy instruments have been adopted in the United States and Russia, but also why public authorities have created particular instruments. It permits distinguishing the features of environmental regulation in both countries, and explicating the most important (institutional) factors that shape each country's regulatory choices.

There are advantages and disadvantages to binational and multinational comparisons (Vogel 1987). Binational comparisons are better able to explain national differences in regulatory policies. Not only is the number of variables more manageable, but it also gives a better position to engage in a more detailed analysis of the institutional contexts within which policy tools are developed. In addition, the historical dimension and the attention to institutional legacies of the countries tend to restrict the comparison to two countries.

I selected the United States and Russia for several reasons. The U.S. environmental policy process, including that of instruments' choice and application, are dealt with extensively in the literature (e.g., Tietenberg 1985; Vogel 1987; Stavins 2000, 2003; Sterner 2003; Harrington, Morgenstern 2004). There is a large amount of research on the politics of environmental administration and management (e.g., Lieber 1975; Mann 1982; Rosenbaum 1995; Portney and Stavins 2000). The U.S. model of environmental policy is usually compared to the European environmental policy institutions and styles (e.g., Lundqvist 1980; Vogel 1986; Pfander 1996; OECD 1997; Bruijn

de and Norberg-Bohm 2005). The outcome of these studies is an understanding that environmental policy in the West, and especially in the United States, has been the focus of a continuous political struggle, and that rising awareness and criticism about established environmental programs result in a multiplicity of efforts to experiment and apply new policy approaches. Environmental quality control is obviously a concern for all industrialized countries in the world, not just Western societies. As Barbara Jancar (1987, 5) notes, "there is not a single industrialized country that has not taken a proenvironmental stand" and where a governmental response has not developed to cope with the problems of pollution. Russia as a large industrialized country has also been struggling with pollution control, the institutional design of environmental authorities, and policy instrument options. While Russia looked very different from the United States, as well as any other Western country a decade or so ago, now it is a country in transition, whose dramatic changes in economy and society make it more like a Western country. Moreover, in its transition and search for new modes of governance, not just in the environmental protection sphere, Russia is looking closely at the U.S. experience, but is studied much less in this regard than other industrialized countries or countries of the post-Soviet block.[3]

By comparing the U.S. environmental protection institutions and techniques and the Russian policy instruments and practices, this book unravels the structural and historical constraints that institutions place on policies and instruments. It is not presumed that this is a comparison between countries that are similar. However, we see similar processes in the two countries that are different. The realities of environmental policy experiences and a closer examination of policy processes in the two countries demonstrate that, notwithstanding the socioeconomic systemic differences, significant parallels exist between them. Similarities in management philosophies and policy methods are reflected in Goldman's "convergence" approach: similar problems drive similar solutions (Goldman 1972). In the United States, environmental protection was not left to markets alone. Rather, it predominantly embodied governmental direct regulation to discontinue treating the environment as free goods. Similarly, the Russian government had no other choice but to apply direct regulation. Marxist ideology placed the value on the objects that incorporated human labor, treating the natural environment as free goods. Because all the natural resources were the ownership of the state from the beginning, to prevent the overexploitation of cost-free resources, the government developed direct regulation methods.

An increasing concern for the environment, the often-limited and inadequate performance of direct regulation, and a search to reconcile economic and ecological imperatives resulted in a move toward regulatory

reform and the introduction of flexible tools in both the United States and Russia. The type, scope, and timing of the introduction of incentive-based instruments in the two countries differ. The comparison demonstrates that these variations in the introduction of flexible tools depend on the structure and location of policy authority, the regulatory traditions, and institutional capacities in both countries.

A comparison of policy choices within and across cases provides a detailed analysis of the individual policy instruments and the conditions for their adoption at particular times, but a formulation of a very general argument may suffer. At the same time, the ability to generalize from the comparison depends on which institutional factors are involved. For example, many countries have established environmental protection authorities and pollution regulation requirements that are not dissimilar to those of the countries studied here. In addition, many countries in the world are searching for more effective ways to protect the environment, and consequently for models of what to do and what not to do when designing new approaches. Traditional discussion of the variation in the effects of direct regulation versus flexible tools in many countries has been one-dimensional—"devoting attention to the choice of instrument while ignoring the preconditions of applying any instrument effectively" (Afsah et al. 1996, 14). Explaining when and how one set of instruments or the other is adopted has received considerably less attention. It is not only important to simply choose an instrument, even if it is masterfully crafted in one country. It is more important to understand what conditions allowed this instrument to be crafted and adopted. On the one hand, this process may take the form of matching instruments to a country's conditions, including institutional design characteristics. On the other hand, there may be a need to develop or redesign domestic institutions before a desired instrument can be adopted.

Another challenge in a comparative research is to give adequate representation and meaning to the concepts and equivalent treatment of measurement of concepts. The goal is to provide concept definitions that have equivalent connotations in different countries and in different policy areas. In each country, air and water quality policies are selected because they have been and remain major targets of environmental policy authorities in the United States and Russia, and because they are similar environmental media. Obviously there are differences in both regulatory approaches used in these policy areas in both countries and in the application of such concepts as 'standard.' In the United States, different types of standards formed the basis for policy in air and water protection. For instance, performance standards prevailed in air quality policy and technology requirements dominated water quality policy. In Russia, very similar standards shaped air and water policy,

but the nature of environmental agency changed over time. For instance, the federal agency responsible for environmental protection was reorganized and renamed multiple times.

To overcome possible confusion, this book proceeds along the following lines. It provides the definitions to concepts that are differentiated geographically, politically, and/or linguistically. The book keeps the meaning that relates to key concepts and terms consistent within and across cases. It explores factors that influence the introduction of flexible instruments within countries through the lens of historical institutional analysis, and it uses comparative institutional analysis for cross-case and cross-country study. Each empirical chapter explains and analyzes the chosen policy instruments and alternatives to those instruments. Specifically, the emphasis lies in the explanation of the nature and location of environmental authority within governmental structure, and the nature of the decision-making structures, different policy functions, and levels of government for each country.

Still another challenge in a case study design that employs a qualitative comparison is to monitor and assess whether the identified institutional variables or some other factors more plausibly explain the introduction of flexible tools. While making reliance on full-fledged controlled observations is a difficult procedure at best, relying on a robustness of process tracing helps one to reduce the risk of confusing the direction of causality. To explore a chain of events and reveal the patterns of institutional existence that impact policy instrument choices I develop a causal story including supporting empirical evidence and demonstrating how specific policy and institutional factors led to the adoption of various policy instruments. All four cases are divided into time periods and studied longitudinally by looking at the processes over time through multiple observations, not just by studying past events. This enables a sustained analysis of policy innovation patterns over time that could not be achieved through a straightforward technical exercise of matching instruments with particular policy problems.

Because the purpose of the book is to explain the development of policy approaches over a long period of time in different settings, it must rely on the written record. Obtaining such data may pose some challenges such as changing ways of understanding and reporting policy innovation. Using contemporary definitions is probably the only way to deal with this difficulty. I analyze legislative and regulatory activity in air and water quality policy in the United States and Russia from 1960 until the present by examining the content of the relevant U.S. and Russian environmental statutes and regulations, legislative history, and court decisions. I also searched and studied relevant journal articles, press releases, governmental documents and reports, and nongovernmental groups' publications that deal with air and water quality policy in both countries.

Without a doubt, other strategies can be adopted to explain whether, when, and how governments introduce flexible policy instruments for environmental protection. The hope is that current analysis enables constructing analytic claims about regularities and relationships between the institutional factors and the introduction of flexible tools. The book presents one effort to enhance our understanding of the conditions necessary for diversifying policy approaches so that we can apply them more successfully.

OVERVIEW OF THIS BOOK

A conceptual framework that views policy changes through the lens of institutional development is presented in chapter 2. The chapter discusses the justifications, virtues, and failures of governmental regulation, as well as the concepts of policy choice that instruct us about the preferred and pursued policy alternative. It reviews the types of policy instruments and identifies the major factors hypothesized as explaining the introduction of flexible approaches.

Chapters 3 and 4 explain how and why flexible incentive-based instruments have developed in the U.S. air and water quality policies, respectively. The challenge, these chapters argue, is to understand that the introduction of flexible approaches depends on consistent rule-making, attention paid to past practices and experiences, and mechanisms of public accountability. These chapters also place these findings in the larger context of the rise of governance theories about policy design, implementation, and delivery.

Chapters 5 and 6 analyze air and water policy strategies in Russia during the Soviet and post-Soviet times. They demonstrate that, notwithstanding many instrumental innovations, it is much more difficult to establish and implement flexible approaches in a system in which institutional practices and jurisdictions established in the past are not only prevalent but also ineffective. They also link the discussion about policy innovation to the debates on shifts in governance strategies in transition economies.

In chapter 7, the book integrates the findings from the case studies and emphasizes that flexible instruments shift a focus from a standard setting toward generating incentives and focusing on desired outcomes by providing economic and societal actors with greater flexibility for responding to policy concerns and encouraging innovation. It concludes with a discussion of political and policy implications of the introduction of flexible instruments for environmental policy. The U.S. and Russian experiences also hold useful lessons for many transition economies and developing countries, as well as insights for improving performance in other policy areas. The diversification of policy instruments helps improve effectiveness and efficiency of policy design and implementation, as well as streamline policy decisions.

The book ultimately raises questions of feasibility of policy changes and good governance. Policy innovations tend to reflect the institutional background and the configuration of political forces in a country. The introduction of new policy tools is not plainly deduced from inherent characteristics of instruments, and solely economic perspectives are insufficient to guide instrument choices. The adequacy and legitimacy of particular choices are bound up with legal, political, and institutional factors that operate in a particular country. The introduction of policy instruments is a political process and an essential part of increasing policy effectiveness, capacity, and accountability that characterize good governance.

CHAPTER 2

On Institutions and Instruments

Ever since seminal works[1] on pollution trading appeared in the 1960s and 1970s, there has been mounting attention to incentive-based instruments for environmental policy in many countries in the world. Countries that express interest in the adoption of flexible instruments for environmental protection more often than not recognize the ineffectiveness and rigidity of command-and-control tools. However, all of these countries are facing various challenges in trying to move from a traditional set of regulations to the introduction of flexible policy tools. What makes these countries desire flexible instruments? Why do some countries have greater successes in adopting incentive approaches? What are the objectives of the government and the target groups? How much change in environmental legislation and regulations is required? To what extent can flexible tools be adapted to various circumstances of place and time? Reliable answers to these questions demand thorough examination of past experiences with efforts to adopt alternative policy instruments. Such examination, in turn, benefits from understanding the factors—institutional, political, and others—that shape the process of introducing innovative approaches in policy and lead to new modes of governmental action.

Multiple factors can influence the adoption of alternative tools in environmental policy. Among them are the nature and type of environmental problems, institutional arrangement and organization of authority among different levels of government, social relationships within policy community, coordination of decision-making between agencies, information channeling, and resources and power of actors that influence policy design. The challenge is to make sense of this complex policy and decision-making world by constructing a framework that allows us to explain governmental policy choices.

Understanding the introduction of different policy approaches as a function of an opportunity structure associated with institutional configuration and a path of institutional change can provide the necessary lens. The institutional approach recognizes that policy actors and actions are constrained or facilitated by institutionalized practices, which filter the possibilities for choice. The prediction is that the mode and tools of governmental regulation depend on the institutional background, experiences, and policy demands.

This section develops an historical institutionalist framework to demonstrate that institutionalized rules, norms, and practices define the modes of governmental intervention and affect the process of instrument formation. It discusses the attributes of governmental regulation, defines types of policy tools, and analyzes institutional factors that guide governmental choice of policy techniques to form the basis for subsequent empirical analysis.

INSTITUTIONAL PERSPECTIVE ON GOVERNMENTAL REGULATION

If we are to understand the choice and design of policy instruments, then we need to look into how and why governments regulate. Governmental regulation of the economy is usually aimed at supporting competitiveness and efficacy of markets or preventing the societal costs of monopoly practices. The goals of social regulation are to balance the interests of the community or public at large and to reduce health, environmental, or social impacts of negative externalities. These and other types of regulation have developed over time in different countries through institutionalized political processes, when governments realized that self-regulation is lacking or ineffective (Lipschutz 2005). Governmental regulation may be weak or heavy, may take different forms, and may target individuals, groups, businesses, and subgovernments. Notwithstanding these variations, it is an art and craft of regulation to develop methods and tools of intervention and identify the targets within a particular political context.

This political context usually represents a well-established national policy style and expresses standard patterns of interaction between governmental actors and societal actors, as well as among different types of authorities (Vogel 1986; Andersen 1994, 2000). Institutions, within which actors operate, provide them with criteria of success and failure by constructing rules and norms for behavior and granting authority and resources to some actors and not to others. The formal institutions are rules, organizations, and standard operating practices that enable actors to define their interests, interact and structure their power relationships (March and Olsen 1989, 1996; North 1981; Thelen and Steinmo 1992). Institutions determine be-

havior of policy actors and provide the means by which actors may sustain or change behavior and initiate or preclude policy reform (Immergut 1998). The informal institutions are moral and ethical behavioral norms as well as habits and traditions designed to constrain the behavior of individuals (March and Olsen 1989; Steinmo 2001). For instance, Douglas North (1981) sees ideology and construction of legitimacy as a crucial part of politics. Compliance with institutional rules is so costly that enforcement of any number of rules in the absence of some degree of individual restraint from maximizing behavior would render a political institution unviable, hence an enormous investment should be made to convince individuals of the legitimacy of these institutions.

Built on procedures, paradigms, knowledge, and beliefs, institutions reflect the routines in which people do what they are supposed to do, thus stabilizing social actions and norms. Political, economic, and societal interests per se are not institutions, but they can become institutionalized to ensure that rules, organizations, and practices will support or strengthen their future actions.

Institutions function to provide stability and order, but they themselves undergo change, both incremental and drastic, permitting innovations and policy change (Tolbert and Zucker 1996; Jepperson 1991). Whether or not new strategies and mechanisms of social action become accepted depends on the degree to which a new model fits with existing or emerging institutional practices. The impact of innovations is only fully realized when they become institutionalized into the standard operating procedures of key institutions and organizations, and absorbed into the worldview of those who manage them (Sikkink 1991).

Institutions represent the interplay of structure and agency by influencing both the goals of political actors and the distribution of power among them in a given milieu (Skocpol 1979). They are a significant force in politics and decision-making, and their weight is felt in policy actions and effects. For instance, Ellen Immergut (1992) demonstrates how institutions in Sweden, France, and Switzerland establish different rules for politicians and interest groups seeking to adopt or halt health policies. Constitutional rules and electoral results produce different restraints on the ability of governments to introduce new policies. Such "relational character" (Hall 1986) of institutions is especially important for our understanding of how institutions influence political interactions and policy design and outcomes, which are the essence of governmental regulation.

If institutions influence politics and policy by constraining or enabling actors' behavior, then governmental regulation may be explained on the basis of actors' preferences for particular choices in a strategic context of rules. Indeed, rational choice institutionalism describes this context by laying

down the rules according to which actors are identified and prospective outcomes are determined. An institution, like a game form, is based on the idea of a structure-induced equilibrium (Shepsle 1989; Bates et al. 1998). Institutions define the strategies that political actors adopt in the pursuit of their interests. The provision of regulation in this case depends on legislative behavior, voting patterns, institutional structure of the legislature, and preferences of regulators, such as rank, salary, and security. The choice of means to achieve policy goals is constrained by the organizational settings and reward opportunities that governmental decision-makers rationally pursue. Institutional structure and procedure combine with given preferences to produce sociopolitical results.

Yet, institutions play an even greater role in shaping politics and the ways governments regulate. Institutions fashion the framework for policy development by establishing responsibilities. They reflect the evolution of structural and procedural constraints that influenced multiple incremental choices made by actors working within these constraints (Hall 1986; Immergut 1998). By analyzing institutional change and consequences of such change for political behavior and policy design over time, historical institutionalism provides a leverage to account for political decisions and understand the roles and functions of institutions themselves. Institutional existence and dynamism explain the context that favors certain strategies and methods of policy. Institutional framework may create windows of opportunity for innovations. Governments may not employ such opportunities, but, if they do, the result is a noticeable departure from previously established practices. Viewed as an evolutionary process, occurring within the institutional framework, the shift from traditional direct regulation to the use of incentive-based flexible approaches is a result of institutional constraints or possibilities.

For comparative analyses of policy instruments, it is especially important to pay due attention to structural arrangements and institutional practices that determine who is empowered to decide on alternatives and what authoritative decisions develop at particular points in time. Kathleen Thelen and Sven Steinmo (1992, 5) describe the value added of comparative institutional studies to explain the differences between countries by explicitly analyzing the "institutional landscape" of political action. Institutional arrangements and practices, which are developed over time, have a comprehensive effect on subsequent policy choices in the sense that even when structural changes are made, initial choices would have an enduring impact. As Stephen Krasner (1984, 235) puts it: "The institutional structure of the past places constraints on the possibilities for the future."

To be sure, the introduction of incentive-based flexible regulations is a change in regulatory approaches, which are constrained by the institutional practices developed over time different contexts and in different countries.

Explaining why this change takes place in some times and places but not others requires a comprehensive institutional approach, and an examination of the timing and content of laws and regulations, the organization of governmental agencies, and the distribution of responsibilities among authorities that determine the tools of governmental regulation. In environmental regulation, there are observable changes in both the tools of intervention and the institutional and organizational setting and perceptions of the government. These changes in environmental regulation represent a dynamic interaction of complex conditions of action. It is the issue of the success conditions for actions to adopt incentive-based flexible instruments in environmental policy, which ultimately signifies the transition to new methods of governing and balancing social relationships in environmental protection.

ENVIRONMENTAL REGULATION

Environmental problems are usually recognized as an unavoidable result of economic growth, where environmental degradation is a social cost (Pearce and Turner 1990; Hackett 2001). The essential questions of who should protect the environment, how much to protect, what should be paid in protecting the environment, and what methods to use in protecting it must be answered. In Western societies, especially in the United States, the theory of market failures explains why governments protect the environment (Markandya and Richardson 1992; Weaver 1995). Environmental protection is a public good that market by itself would not supply. The government intervenes to control the side effects of production, such as pollution, to allocate the use of natural resources, and to provide information about environmental conditions.

While the theory of market failure was developed to explain governmental intervention in the Western capitalist democracies, it also offers a promising lens through which to view environmental policy process in other countries, including centrally planned, transition, and developing economies. Environmental pollution problems are to a large degree side effects of economic production, namely, "externalities," and they exist in any type of economy (Baumol and Oates 1979; Panayotou 1992; Hettich 2000). The persistence of negative externalities—the damages from economic activity borne by society as a whole—makes governments choose a course of action and tools of action to cope with the social problems of environmental quality.

In principle, governments can try to intervene only minimally. They can attempt to generate much of the information to determine the extent of negative externalities and intervene efficiently. For instance, governments can

calculate and impose a right tax on polluting activities (Pigou 1920). This would move the burden to producers and consumers of the products and processes that pollute in order to benefit society in general. This would also give the polluters an incentive to abate and a choice of changing their behavior. The better the polluters abate emissions, the better off they are financially: "the less it emits, the less its tax bill" (Baumol and Oates 1979, 237).

In reality, the calculation of a tax is not a simple thing. Even though governments can collect some information, assess the risks to society, and decide on a tax rate, the application of a tax will not fully internalize the negative externalities, owing to the difficulties in measuring the marginal external costs, interest group rivalry, and especially political expediency in the policy process (Helm 2000; Hackett 2001). Moreover, the theoretically ideal Pigouvian tax does not represent real-world experience, where the normative power of economic analysis runs up against the realities of politics.

Many other theoretical perspectives on the relationship between the economy, the natural environment, and the government, especially economic approaches, attempt to solve the problem of environmental regulation. Most economic approaches do not take into account the institutional realities or emerging demands of the sociopolitical system, push for market-based approaches in regulation, and cast doubt on the need for extensive governmental involvement. Ronald Coase (1960), however, who belongs to the economics and law tradition, stressed the importance of institutional factors, such as property rights. The need to define who owns or controls what resources should help explain who causes externalities and who suffers from them. In this case, governments should define property rights and establish the institutional framework to encourage market bargains in the externality, or pollution trading schemes.

As environmental problems started to accumulate, societal concerns pushed governments around the world to not simply estimate the extent of property rights, but rather to protect the public at large through extensive and direct methods of governmental intervention, such as uniform standards, prohibitions, and technology requirements. Command-and-control emerged as a policy tool for dealing with instances of rapidly changing environmental conditions, and situations involving hazardous pollution (Baumol and Oates 1979). Obviously, direct control is only one of many ways governments seek to regulate society and individual conduct, but it expresses the features of "real government that are politically significant . . . [where] the most significant political fact about government is that government coerces" (Lowi 1972, 299). Coercion is direct and immediate, which is usually exemplified by the existence of deadlines and sanctions. It is directed to show the might of the government to address societal problems. In addition, focusing on the character of coercion and inducement and the probability of their

use, environmental protection prescribes regulatory policies (Wilson 1980). This is mainly because a policy problem is one of correcting or achieving particular behaviors or habits of specific individuals or groups. Regulatory policies seek to protect the general public by providing public goods and setting the conditions under which various private activities can be undertaken (Mitnick 1980). An emphasis on limitations, which is placed on specific groups or individuals for the sake of a wider society, defines the patterns of social policies stressing respect to authority and direct regulation.

Without a doubt, direct regulation has brought about considerable achievements in environmental quality in many countries. In the United States, emissions of all major air pollutants decreased by approximately twenty-five to thirty percent since the introduction of the first major federal act in 1970 (Cole and Grossman 2005). In Germany, the intensity of sulfur oxides and nitrogen oxides emissions (kg/unit GDP) is sixty-five percent and fifty percent below the OECD averages (Weidner 2002). Emission for conventional pollutants in Russia also fell by about twenty-five to thirty percent in the 1990s (OECD 1999). Direct regulation still remains the basic tool of environmental policy, but the one that is increasingly showing the signs of inability to cope with emerging or residual environmental problems. Direct control has its own significant drawbacks in relation to the regulated community, the government, and many societal actors. Command-and-control instruments do not cater to various conditions confronting individual entities and they give little or no flexibility to economic actors. Viewed as too costly or burdensome, they risk diminishing public support and increasing noncompliance (Hatch 2005). Direct regulation does not only affect policy efficiency and costs for the regulated community, but also imposes burdens on the regulators themselves. The adversarial and legalistic character of direct controls and the mounting costs of implementation and enforcement undermine policy effectiveness, resulting in governmental or policy failure.

In essence, this governmental failure is a discrepancy between quantity and quality of governmental intervention (Andersen 1994). When direct governmental intervention is unable to fully address the concerns of environmental effectiveness, economic efficiency, and political expediency, more effective solutions are required to alleviate social problems of pollution. While environmental degradation is a pervasive and inevitable phenomenon that requires governmental intervention, the forms and methods of governmental intervention may be changed to reflect more successful approaches to solving environmental problems. To be sure, it is not a choice between prohibitions and markets. Markets involve prices and quantities, and prohibitions are often backed by economic sanctions (Sterner 2003). Developing new ways of regulation requires a complex approach of combining policy instruments, setting up the limits on pollution, and specifying the responsibilities, rights,

and obligations. Increased choice and efficiency for the regulated entities have to be matched with a greater governmental effort to keep the same level of assurance that environmental goals are reached (U.S. Congress, Office of Technology Assessment 1995). The opportunities for public information and input, as well as opportunities for voluntary participation and agreements in environmental protection, must be established. The successes and failures of past regulations need to be reassessed.

In short, it is a development of approaches that represent new governance mechanisms by providing flexibility to the regulated communities and regulators, allowing for continuous improvement of policies through stakeholder participation, and enhancing governmental capacity in environmental protection. The challenge lies in finding a type of governmental intervention that is most effective and efficient, examining the compatibility of alternative approaches with the styles of both policy-making and implementation in a particular country, and finally establishing an institutional framework for policy learning and innovation. These are the issues of political, technical, and institutional feasibility of applying different policy instruments and initiating and sustaining policy change.

The next two sections address these feasibility issues and examine more closely and systematically the types of policy tools and the determinants for their introduction and implementation. They discuss what types of instruments are available for adoption, what the advantages of flexible instruments are, whether there is a need for the threat of penalty for noncompliance, and, finally, whether and how it is possible to adopt alternative instruments.

REVIEW OF POLICY INSTRUMENTS

When explaining the introduction of policy tools, the first issue that arises is what exactly they are. This section defines a concept of policy instrument, delineates major typologies and characteristics of environmental policy tools, and provides an analysis of direct regulation and flexible instruments.

Policy Tools: What Are They?

At first sight, a concept of policy instruments seems simple. In reality, it may be quite difficult to define. Instruments can be seen as objects, such as laws or administrative directives. Instruments can also be understood as an activity, or a collection of policy activities, including informal activities, such as rhetoric. Sometimes policy instruments are defined as everything that an actor can use in order to achieve one or more goals (Bruijn and Hufen 1998).

This study defines public policy instruments as a set of tools and techniques by which "governmental authorities wield their power in attempting to ensure support and effect social change" (Bemelmans-Videc et al. 1998, 3). This definition presupposes that policy instruments are a specific form of intervention by the government. Policy instruments indicate how policy is being interpreted and implemented. In general, policy instrument choice reflects political or administrative strategies of the government, and indicates certain periods in the historical-institutional development of a country.

Economists were the first to identify generic instruments. For environmental quality control and problems of externalities, Pigou (1920) defined the optimal level of pollution consistent with maximizing social welfare, where appropriate instruments, such as taxes, can be used to internalize externalities. Dahl and Lindblom (1953) laid the foundation for the political study of policy instruments and identified four main tools of control: market, or price system, polyarchy, or democratic institutions, bargaining, and hierarchy. A mix of these tools used by the government was seen as leading to the "maximal achievement" of social goals.

The instrumental approach can also assess the characteristics of policy tools emphasizing the degree of coerciveness, which is rooted in political structure and ideological commitments (Linder and Peters 1998). Efforts to explain policy instrument emergence turn to the notion of national policy styles, which range from bargaining to imposition (Richardson 1983). Still another way to look at policy instruments is to focus on major policy functions by either linking different methods of governmental intervention to various political processes (Lowi 1972) or treating instruments as determinants of political process or programmatic policy success (Pressman and Wildavsky 1984). Moreover, instruments may reflect the institutional background of different political systems and their traditions and paths of regulatory development (Vogel 1986; Andersen 1995, 2000). Different instruments are deemed to structure policy processes as well as respond to political and institutional arrangements of a country.

Types of Policy Instruments

This attention to policy tools encourages multiple typologies of instruments. The most inclusive approach to understanding policy tools is a maximalist typology, which is based on an exhausting list of "all possible instruments" (Vedung 1998, 22). Here, little effort is made to group instruments, and all possible kinds of governmental interventions are presented. On the contrary, a minimalist scheme usually presents a dual categorization of instruments, based on negative instruments (penalties) and positive instruments (incentives).

The dichotomy of direct regulations versus economic instruments is one form of a minimalist typology of instruments.

The most widespread approach to instrument classification is the so-called carrots, sticks, and sermons, which explicates economic instruments, directives, and informational tools respectively[2] (Bemelmans-Videc et al. 1998; Sterner 2003). This threefold typology can be expanded to account for the methods that policy actors use to influence the opportunities, information, and goals of policy subjects. The regulatory strategies may include six distinct types of action based on the approaches by which they change behavior: deterrent, remunerative, preventive, generative, cognitive, and normative (Mitchell 1997). Yet, it may be necessary to view instruments in combination rather than in isolation to better capture various patterns of instrument design and implementation (Hood 1983).

Recognizing the merits of these mentioned typologies, this study divides and analyses environmental policy instruments into two broad categories. The first category encompasses a wide range of direct regulation[3] tools, and the second category includes a variety of flexible tools. The main reason for employing such a typology lies in a characteristic distinction between direct regulation and flexible tools, or the degree of coerciveness and availability of choice. Moreover, it is not a narrow distinction of "standards versus taxes," or directives versus economic instruments. Both types include a variety of instruments and strategies, and rely on legal, economic, and informational/preceptoral approaches. Table 2.1 (page 32) classifies direct regulation and flexible environmental policy instruments.

Direct regulation tools are formulated rules, standards, directives, and prohibitions, which mandate the targets to act in accordance with what is prescribed or ordered in such rules and standards (Vedung 1998; Bruijn and Hufen 1998; Ermakov and Sukharev 1997; Tietenberg 1999). Command-and-control instruments are often associated with coercion or threats of negative—legal or economic—sanctions, such as penalties, fines, or imprisonment. Direct regulation carries an authoritative character, meaning that targets are obligated to act in a certain way. Information provision is phrased in the negative: deterring the target from performing an activity or requiring information provision. Direct regulation has a reactive character as well, because directives are enforced after the undesirable behavior is detected. The application of directives requires monitoring, inspection, and enforcement (U.S. Congress, Office of Technology Assessment 1995). Carrying out monitoring and enforcement functions may be a difficult task for many governments, especially where institutional capacity building mechanisms are not developed.

Flexible policy instruments are perceived as having a noncoercive and incentive-based character. Such instruments are based on giving and

taking away resources, increasing opportunities for desirable behavior, or persuading instead of deterring (Baumol and Oates 1979; Bemelmans-Videc et al. 1998; Vedung 1998; Braadbaart 1998). Flexible tools involve provision of incentives, rather than prohibitions, specified in regulations. They give targets *the choice* of changing their behavior[4] and multiple options for achieving compliance. Flexible tools can also foster innovation by creating a goal toward which targets strive. Flexible *economic* instruments make it more or less expensive to pursue certain activities. Such instruments are also more cost-effective; they allow achieving policy goals at a lower cost (Helm 2000; Sterner 2003). Flexible *informational* instruments rely on the strength of moral suasion and persuasion to achieve desirable behavior. They can also provide enterprises and individuals with new or more precise information to facilitate compliance and support desirable behavior.

Such a categorization of instruments for environmental policy also suggests several dimensions along which policy instruments may be analyzed and consequently adopted. It considers the advantages and disadvantages of establishing and implementing direct regulations and flexible tools (see Table 2.2, page 34).

It becomes clear that the introduction and application of directives and flexible tools depend on the background of regulatory and institutional realities, and face difficulties in terms of costs, accountability assurance, and policy change. Direct regulations may be easier to establish, but flexible tools are more responsive to change and adaptation. Direct regulations may supply more predictability of performance, but they lack an innovation spark. Flexible instruments do not provide effectiveness in crisis but are more likely to work under changing conditions. This again brings us to the key issue—what causes direct regulation and what causes flexible policies. Obviously, policy instrument choices are not merely based on the characteristics of tools themselves, but rather on certain policy goals, institutional possibilities, and regulatory structure that may facilitate or impede the establishment of flexible policy tools.

DETERMINANTS OF POLICY INSTRUMENT ADOPTION

This diversity of policy instruments and the variety of conditions under which they can function make us look more closely at what influences governmental choice of policy tools. The ability of the government to address social problems within the territory over which the government exercises jurisdiction usually increases with the growth in the means or instruments of carrying out intended policies (McAdam et al. 2001). The preferred and pursued policy instrument is a result of many considerations, including public

Table 2.1 Categorization of Environmental Policy Instruments

Policy Instruments	
Direct Regulation Instruments	
Health/Harm-Based Standards (ambient standards)	Establish the highest allowable concentration of a pollutant in the ambient environment
Discharge Limits	Establish required emission or discharge limits based on the volume, concentration, or toxicity of discharge
Design Standards	Establish required emission or discharge limits based on what a model technology might achieve
Technology Specifications	Stipulate the technology or technique a source must use to control pollution
Product bans and Limitations	Restrict or prohibit manufacture, distribution, use, or disposal that present unreasonable risks
Information Reporting	Require pollution sources to publicly report emissions or product information
Flexible Instruments	
Integrated Permitting	Bubble policy: treats multiple emission points controlled by existing sources as if they were enclosed in a bubble. Only the total emissions of each pollutant are regulated
	Netting: allows for the modification or expansion of sources to avoid regulatory requirements for new sources by keeping emissions below an established threshold
	Offset policy: requires new or expanding sources in non-attainment areas to secure sufficient offsetting emission reductions from existing sources
	Banking: allows sources to store certified Emission Reduction Credits for future use or sale to others
Tradable Emissions/Effluents	Any agreement between parties contributing to environmental quality problems that alters the allocation of pollutant reduction responsibilities among the sources. Pollution units are bought and sold to achieve compliance with governmentally established cap on pollution
Pollution Charges	Require regulated entity to pay fixed amounts for each unit of pollution
Voluntary Agreements	Efforts to stimulate regulatory flexibility through site-specific, performance-based environmental standards developed through stakeholder negotiation

continued

Policy Instruments	
Liability	Requires sources of pollution to compensate those harmed to the extent of the damage
Subsidies	Provide financial assistance to pollution sources, either from government or private organizations
Information Transfer and Audit	Employ moral suasion, information provision, and appeals for virtuous behavior. Encourage compliance management systems to detect, disclose, and correct violations
Technical Assistance	Provides additional knowledge to pollution sources regarding pollution control techniques

Sources: Thomas H. Tietenberg. Disclosure strategies for pollution control. In *The market and the environment: The effectiveness of market-based policy instruments for environmental reform*, ed. Thomas Sterner. Cheltenham, UK; Northampton, MA: Edward Elgar, 1999. U.S. Congress, Office of Technology Assessment. *Environmental policy tools: A user's guide*. Washington, D.C.: U.S. Government Printing Office, OTA-ENV-634, 1995.

opinion or demands, the appropriate scope of responsibility for different levels of government, the values held by policy actors, the establishment of a regulatory framework, and the institutionalized patterns of interaction among policy authorities. Policy techniques should be established, administered, respond to change and effect change over time, as well as secure compliance with policy objectives (Mitnick 1980).

If possible, governments would choose policy instruments that are likely to accomplish many things. In environmental policy, governments would choose those tools that would bring the country toward a better and safer environment, while adjusting to the institutional, scientific, social, and technological changes and maintaining economic growth. To accommodate all the values and considerations is difficult at best. However, governments may emphasize one or two criteria and rely on other instruments to supplement the chosen ones for an effective strategy (U.S. Congress, Office of Technology Assessment 1995). What are these specific criteria that the governments use to develop and choose policy instruments?

The major concern of environmental policy is achieving environmental results. It is the goal of environmental policy to attain better environmental quality and not simply change the behavior of individuals, groups, and enterprises. To assure that environmental goals are met, direct regulations establish a foundation for verifying compliance on a point-by-point basis (U.S. Congress, Office of Technology Assessment 1995). However, pollution prevention, rather than pollution control, may become an equal priority, where technical and informational assistance and increased environmental performance through audit, environmental management systems at the level

Table 2.2 Advantages and Disadvantages of Establishment and Administration of Direct Regulations and Flexible Instruments

Direct Regulation Advantage	*Flexible Instrument Advantage*	*Functional Categories*
		Establishment
Yes	No	Establishment of Regulatory Framework
Yes	No	Initial Information Cost
No	Yes	Coincidence with the Preferences of the Targets
		Change
Yes	No	Predictability of Performance if the Preferences of Targets Change
Yes	No	Rigidity, but Collective Support
No	Yes	Innovation
No	Yes	Individualized Adjustment to Changing Environmental Conditions
No	Yes	Difficulties in Overcoming Legitimacy and Collective Support
No	Yes	Gradual Change
Yes	No	Assurance of Meeting Environmental Goals
No	Yes	Cost of Change in Regulation
Yes	No	Effectiveness in Crisis
		Administration
Yes	No	Intrinsic Costs
No	Yes	Costs of Operating the Regulation
Yes	No	Feasibility of Coordination and Planning
Yes	No	Predictability of Impacts
No	Yes	Choice Factors
No	Yes	Adaptation to Local Conditions (decentralization)
		Enforcement
No	Yes	Enforcement Costs
No	Yes	Cost of Extension of Monitoring
Yes	No	History of Supply of Regulation / Deterrence
No	Yes	Likelihood of Compliance if Enforcement is Absent
No	Yes	Likelihood of Compliance under Changing Conditions

Sources: Barry M. Mitnick. *The political economy of regulation: Creating, designing, and removing regulatory forms*. New York: Columbia University Press, 1980. U.S. Congress, Office of Technology Assessment. *Environmental policy tools: A user's guide*. Washington, D.C.: U.S. Government Printing Office, OTA-ENV-634, 1995.

of enterprises, and voluntary agreements may become be quite useful. Beyond flexibility, considerations of environmental equity and justice require that environmental goals be met in an appropriate manner in all jurisdictions in the country. This option suggests more attention to institutional reforms rather than simple choice of instrument based on expected performance.

Obviously the benefits and costs for society, for targets, and for the government (Pearce and Turner 1990; Helm 2000) become another consideration. If the government wants to emphasize more cost-effective responses to environmental issues, the solution might be choosing those tools that give the obligation of choosing means and compliance schemes to the targets (Sterner 2003). This may give the targets an opportunity to implement the least-cost solutions. This option may, however, place increased demands on the government to allocate rights and responsibilities and ensure compliance. This also may generate concerns from the societal groups and the public at large about the fairness, speed of application, and environmental effectiveness of such approaches.

Still another set of considerations is tied to change. By introducing policy instruments that lack adaptability to institutional or technological change, a country may create "barriers to responsive policies and innovative solutions" (U.S. Congress, Office of Technology Assessment 1995, 27). Once policy tools are adopted, it is very difficult to change them. On the one hand, this may lead to a long-term guaranteed success in policy outcomes, if adopted policy instruments work. On the other hand, this may result in administrative rigidity, if chosen techniques do not work to alleviate socioeconomic problems. The governmental task is to design the tools of regulation with clear and stable policy requirements and reasonableness of objectives, which allow targets to develop compliance approaches that are adaptable but not prone to frequent modifications.

In short, developing effective and efficient policy tools to deal with environmental problems is a challenging enterprise. Introducing new policy instruments requires governments to analyze tool characteristics and country-specific political, economic, institutional, and organizational conditions that will allow an instrument with desired features to be implemented. The elements of design of policy approaches involve promoting goal achievement, innovation and regulatory reform, increase in compliance and capacity for dealing with changing demands to make policy more flexible, credible, and potent.

INSTITUTIONAL FORCES SHAPING THE DEVELOPMENT OF POLICY INSTRUMENTS

Accounting for political, societal, institutional, and organizational forces shaping the introduction of policy tools tells us that the choice of instruments

is far from an easy mission (Bagchus 1998). Not all instruments are equally acceptable for all government interventions and each policy instrument has a policy context. When and how governments intervene into and amend the institutional framework of responsibility present in the economy and society depends on the restrictions and possibilities that governments face from the "core circumstances" (Bressers 2001; Lemaire 1998). These are the factors within the policy context that influence the development of instruments, and are usually described as power and information distribution within the government, policy style, organizational setting, policy learning, and capacity to ensure that policy goals are met effectively and efficiently. However, given the similarity of environmental quality problems and the similarity of potentially available solutions, it is the institutional factors that exert fundamental influence on the adoption of instruments (Lundqvist 1974; Jänicke 1992).

In general, new or alternative policy instruments have a greater chance of being instituted in cases when they do not require significant reorganization of institutional relations and structures, that is, when the instruments are politically feasible and painless. In particular, instrument development depends on the procedures and mechanisms for goal achievement provided by existing legal requirements, regulatory background, and the actual carrying out of legal provisions (Anderson 2001). A comparative analysis of the introduction of flexible environmental policy instruments in the United States and Russia emerges from the examination of the distribution of policy competence and authority among different parts of government, regulatory traditions, and governmental capacity in order to evaluate the institutional feasibility of policy instruments. Specifically, I will address the location and nature of environmental policy authority, the source of policy provisions, the types of extant regulations, the provision for accountability, and the capabilities of regulatory agencies to implement policy requirements to the process of flexible instruments introduction in environmental policy.

Location and Nature of Environmental Authorities

The process of policy instrument adoption is influenced by the institutional obstacles in search for the optimal level and type of government structures. One of the explanations of why governments introduce flexible policy tools to control pollution arises from the structure and nature of the governmental bodies responsible for carrying out environmental policy. Flexible instruments are more likely to be adopted across the country when an independent environmental agency provides for coordination and guidance in the design of such tools. Policy consistency is crucial to establish links between the intent of policy makers and standards for regulation, as well as among the

individual decisions of regulators at different levels of government based on those standards. Centralization can also bring together specialized expertise and develop a common core of experience and competence, all of which are conducive to performance and continuity in policy development (Lundqvist 1980).

Obviously in some cases centralization of policy authority may be seen as a feature of traditional direct regulation. The demands and complexities of early environmental policy based on command-and-control in particular prescribed highly centralized regulatory structures for pollution control (Kelley, Stunkel, and Wescott 1976; McIntyre and Thompson 1978; Rabe 2000). As we know, a new vision of governance contributes toward an understanding that the functions traditionally assumed by centralized authorities are now being diffused and fragmented among a wide range of actors and at different levels (Nicolaidis and Howse 2001). Devolution and decentralization result in a shift of power from national to state, regional, or local authorities that are responsible for implementing environmental programs, and are deemed to experiment with and introduce innovative strategies.

The prospects of decentralized policy making and implementation are appealing, if only the costs of coordination and consistency in policy delivery were sufficiently low. In many cases, the central government appears to be the "best decision level" because local government is not willing to bear all costs of alternative policy instruments (Larrue 1995). Decentralization can also result in more direct access to local information and creativity on the part of the individual citizens and of various levels of government, but it requires the mechanisms of emulation and distribution if local policy approaches are successful. In addition, decentralization potentially carries the ability to unravel the forces of competition among governmental entities, which may influence the course and demands of environmental policy (Breton, Brosio, and Dalmazzone 2003).

The enthusiasm about the ability of state, regional, or local entities to introduce and sustain innovative and flexible policies has a cautious side to it, especially in the presence of an "enduring concern over how evenly that innovative vigor extends over entire nation" (Rabe 2000, 40). The confidence given to a centralized authority lies in its ability to introduce and implement wide-ranging, enduring objectives, and provide for consistency when it is endowed with "well-defined powers and calculable responsibilities" (Jänicke 1992, 55). Environmental problems specifically are transboundary in nature, which raises questions of interstate or interregional allocation of responsibility and design of policy strategies.

We can address the importance of having a centralized authority for innovative, flexible policy instruments through the following hypothetical situation. In a decentralized system, where states, regions, or localities

can select which policy instruments to use, the result may be uneven, or suboptimal environmental protection (Engel and Rose-Ackerman 2001). Suppose we have two states with equal environmental goals, but different policy tools. One state chooses to use tradable permits and another state sets uniform treatment levels. A new industry may be likely to choose a state with a direct regulation system. In a state with tradable permits, a new industry will have to buy permits from existing permit holders as a part of the cost of entry. In the state with direct regulation, this industry will have to remove a fixed percentage of its pollution. In the first state, pollution levels remain fixed and the price of rights increases. In the second state, pollution levels may increase unless the state responds by increasing the required percentage of abatement from all firms. If industry initially abates equally in both states, so long as other factors are equal, the industry may prefer to locate in the command-and-control state because it does not have to bear the costs of buying the permits. If one state charges industry for their discharges and another does not, this will distort location choices (Engel and Rose-Ackerman 2001). This may pose difficulties in testing new implementation ideas that impose different costs on industries.

In addition, there is a tendency of subnational governments to cling to the organizational design and program priorities established by a central agency. Many of the most innovative activities undertaken at the state or local levels have been at least partially stimulated through centralized federal financial, technical and research assistance (Rabe 1999; 2000). Moreover, effective implementation of federal statutes by a system of decentralized decision-making suggests a system of supervision. With respect to program delegations, that supervision may take forms of detailed work plans drawn by the centralized authority, where states or regions agree to accomplish federal law requirements.

This issue of authority centralization also raises a question of the nature of environmental policy authority. As records of many countries demonstrate, there has been a trend to move beyond traditional placement of environmental programs in public health departments or fragmenting environmental control among agencies with the goals of commodity development, in favor of comprehensive environmental agencies. In the United States, under the terms of the Reorganization Plan No.3, President Nixon shifted the environmental functions performed by the Department of Interior, Department of Health, Education, and Welfare and other agencies to the new Environmental Protection Agency (Kelley, Stunkel, and Wescott 1976; Rabe 2000). In Russia, while there is still a lack of an independent environmental agency, the initial creation of agencies with strictly environmental responsibilities served as a response to the inability of the Department of Health, or Hydrometeorological Service, or the economic bureaucracy to

perform environmental functions (Ziegler 1987). Specifically, the attempts to establish and preserve the State Committee on Environment were seen as creating an institutional foundation for addressing a whole range of environmental concerns and developing tools to cope with pollution.

It seems obvious that in many countries some other agencies would be responsible for specific environmental control functions. For instance, in the United States, the U.S. Fish and Wildlife Service, the Army Corps of Engineers, the Bureau of Land Management, and other agencies carry environmental responsibility. In Russia, the Sanitary Epidemiological Service, the State Committee for Hydrometeorology, and other committees perform environmental control functions. However, without a comprehensive environmental agency, each department's own primary mission, such as resource development or health, would affect its view of environmental policy development (U.S. EPA 2004b). Having a comprehensive and independent environmental policy authority encourages a more consistent pattern of policy development, including the introduction of various policy tools. Without denying the movement toward devolution or making it the only alternative, it is important to consider how centralization of policy authority shapes the process of the introduction of flexible tools. Environmental agencies without competence or independence and statutory authority downgrade the ability to implement a policy or develop appropriate instruments (Wilson 1989; Hall 1993). It is important to "institutionalize environmentalism" (Rosenbaum 1995, 208) because it reflects the ability to explicitly and purposefully redirect the behavior of the regulated entities, and improve the development of policy instruments.

Source of Policy Provisions: The Value of Regulatory Agencies

The adoption of flexible policy tools happens when regulatory agencies take initiatives experimenting with instruments, as well as when regulatory agencies become a source of policy provisions by initiating a legislative response to introduce new instruments. Traditionally, governmental responses to social problems were viewed as consisting of two parts, with one being policy making, which includes definition and prescription of policy tools, and another being administration or implementation of that policy, which includes the application of policy tools (Harmon and Mayer 1986; Frederickson and Smith 2003). This distinction works well when to "administer" means simply to carry out a task. However, to "administer" means something much more complex, including writing specific rules and tailoring rules to specific circumstances, sorting through interests, accounting for consequences, and authorizing actions. By implementing policy, agencies give substance to policy by deciding when and how to intervene. Because of their intervention

the practice of policy implementation is being altered, as it opens new avenues and creates opportunities that were once nonexistent. As agents of government, administrative agencies are charged with making specific the generality of law and creating procedures for applying it to individual cases. The resulting and necessary exercise of such discretion, however, creates dilemmas for agencies.

One aspect of these dilemmas is the control of the bureaucracy issues because agencies are expected to follow what they perceive to be the letter of the law (Frederickson and Smith 2003). The consequence can be fairness in implementation in general and "a crash on individual rights" in particular (Harmon and Mayer 1986). This possibility creates a basis for both legislative and judiciary action[5] in the form of amendments to law and court decisions. Their effect is to guide and bound administrative action. This begs the question about the level of precision, specificity, and detail in policy on the one hand, and the level of discretion in implementation on the other. Control is limited and contingent, and there may be as much political control of administration as there is bureaucratic control over policy.

One of the main factors that cause governmental agencies to assume policy-defining functions is the task demands on the government and the tools that are necessary to perform these tasks. The demands of public policy add to agencies' power in a policy process. The need to perform large tasks, the need for expert knowledge, and the need for fast and tailored action are all needs that administrative and regulatory bodies can perform better than other political institutions (Mitnick 1980). Because bureaucracy holds a quasi-monopoly on the tools to meet these goals, it may be the only way to deliver goods and services demanded by the public. A primary reason why implementation contributes to the power base of the agencies is that law or policy statements can never be specific enough to cover all future applications. The function of the bureaucracy is to cover all the gaps in official policy, and filling these gaps means exercising discretion (Meier 2000).

This discretion caused by delegation of authority does not always result in less efficient implementation. Administrative discretion in many cases can lead to innovation in policy, rather than a stalemate. Political institutions, the public, the regulated community, and individuals are not satisfied if implementation is a strict application of a detailed law. They expect flexibility, creativity, and responsiveness to changing needs. Although bargaining and individual flexibility are sometimes major mechanisms of enforcement, agencies are hardly the passive pawns of their clientele. Many choose which clientele to serve or what position to take relative to their clientele (Meier 2000).

With regard to the establishment of environmental policy instruments, "the language and logic of command and control regulation is politically

innocent" (Rosenbaum 2002, 184). Administrative agencies follow legislative intent for pollution control, which is found in any pollution control law by adhering to the following steps. First, agencies have to regulate toward the goals identified by the legislature. Pollution abatement starts with a determination by the legislature of the ultimate objectives to be accomplished through pollution regulation. The goals are usually made extremely ambitious as a signal for vigorous regulatory measures by regulated interests. Second, agencies identify the criteria for setting pollution standards. Criteria, such as technical data, commonly provided by research scientists, indicate an association between the presence of certain pollutants and the effects on human health or welfare. Third, agencies set environmental quality standards for each pollutant, which are maximum levels of pollutants to be permitted in environmental media. Fourth, agencies create emission/effluent standards and regulations to prescribe acceptable pollutant discharges from sources. Finally, agencies have to provide for monitoring, reporting, and adequate enforcement (Rosenbaum 2002).

Environmental administration shapes the impact of regulation as much as the formal language of law. The emphasis given to law is based on a premise that law guides and instructs regulation. Law specifies policy instruments, and the solutions to instrument development can be found in a legal system (Pain 1995). While making policy and specifying the tools of intervention are within the realm of legislatures, in many cases it is regulatory agencies that design instruments and initiate legislative response. A decision-making force of administrative agencies comes from multiple sources. First is a shift of responsibility to agencies for settling disputes between interests in conflict. Second is assigning authority to agencies to determine standards and prescribe appropriate control technologies necessary to meet mandated standards. Often in the presence of expert dissent about such issues, a large measure of discretion rests with regulatory agencies. Next, agencies equipped with a variety of enforcement alternatives are in the position to choose those options they believe will best achieve their goals. Agencies do apply penalties and fines as a means of guaranteeing compliance. However, resorting to administrative or judicial proceedings creates a prolonged, rigid process with no assurances that polluters will be bound to control pollution promptly. Although administrative discretion and political pressure may limit the vigor and stringency in enforcement of environmental regulations, these constraints are inevitable and may prove to be practical in achieving more pollution abatement (Rosenbaum 2002).

In short, in complex polities such as the United States and the Russian Federation, not all aspects of policy decisions are resolved in the political branches of government. A basis of regulatory power is assumed to derive from discretionary decision-making authority that has to be granted to them

because not all implementation and enforcement scenarios can be conceived of and accounted for in statutes. Both specific statutory authority and discretion have impacts on policy and "environmental legislation insofar as final regulations and guidelines are often drafted by regulatory agencies rather than the legislature" (Congelton 1996, 18). Legislation specifies a direction for regulatory policy, but often it is administrative decisions that ultimately define this policy. Regulatory agencies must interpret legislation in order to implement it (Van Houtven 1996). The fundamental criteria for agency action are found in the legislation. However, even the most precise legislative guidelines leave some scope for interpretation and agency discretion.

Regulatory agencies affect policy through normal mechanisms of policy implementation as well as through innovative implementation and regulatory reforms. Legislatures set general guidelines for regulatory policy, and agencies expand these general guidelines into specific policy actions. In some cases, agencies influence policy through policy initiation (Meier 1985; 2000). Regulatory agencies can also influence policy by stimulating a legislative agenda. Although most bureaucratic regulatory policy making is via the mechanisms of rule-making and enforcement, sometimes regulators implement a law in such a way that new policies and policy tools emerge.

Existing Institutional Templates for New Policy Tools

Command-and-control methods have been used most extensively and most often by many countries in the world to protect the environment. While a case for heavy reliance on flexible tools is a very compelling one, direct regulation still remains a well-known, well-practiced tool, and in some cases the best tool for a particular pollution problem. The key to understanding which instrument to use lies in the conditions in which directives and flexible tools are most feasible and beneficial. If the adoption of flexible instruments does not require a fundamental reorganization of the regulatory system, the more likely and the easier it is that such flexible instruments are introduced. The new tools are welcome if they do not place an extreme burden on administration and if they are grafted onto the existing regulatory framework, where the type of the existing regulations influences the type of flexible instruments. In short, the introduction of new instruments requires evaluating the compatibility with the existing regulatory framework and standards.

Direct regulation represents a clear example of institutionalized rules and normative practices. It serves as a strategy directed at multiple targets, and it embodies to a large degree the principles of universalism and homogenization. Regulations and standards become mandatory and are routinely applied and enforced by regulatory agencies and the regulated. For flexible instruments to be implemented and work successfully, they have to be

institutionalized as well. They also must be based on common practices, rules, and procedures. Prior to implementing a flexible tool, policy makers and regulators must examine various design options, decide which features to employ, and ensure that there is an adequate legal authority (Bluffstone 1998). They evaluate the experience with pollution reduction techniques, requirements for measuring and reporting emissions, and the possibility of serious local health impacts (Baumol and Oates 1979; U.S. EPA 2003a).

Specifically, in pollution control policies, flexible instruments are usually combined with other policy instruments in a setting that largely depends on institutionalized patterns and routines of policy making. Regulations already in place are modified or altered on an incremental basis to support the use of innovative instruments. An existing regulatory framework represents an important precondition for the use of flexible instruments. For example, the introduction of air pollution trading schemes in the United States did not require a full reorganization of a well-established practice of standard setting, permit writing, and compliance monitoring. New provisions for marketable allowances were written into existing permits. In Russia, pollution charge rates for air and water quality are calculated based on the existing standards and limitations, where fees are indexed to reflect the level of compliance. Governments should therefore consider how existing institutions could be used to directly facilitate the implementation of flexible mechanisms (Andersen 2001). The use of various policy instruments usually reflects an evolutionary process of accommodation in which various interested parties play roles in shaping those policies. Innovations that fail to build on what has gone before run the risk of significant opposition, technical breakdowns, and unintended consequences (Mann 1982).

Simply denying the ability of direct regulations to effectively control pollution is not sufficient for the introduction of flexible tools. Changes in regulatory practice and logic shift the regulatory and institutional dynamics, and can empower some actors and constrain and disadvantage others. For instance, in the United States, environmental groups initially opposed flexible instruments, especially market mechanisms based on the polluter-pays principle because flexibility or cost-effectiveness does not automatically guarantee environmental protection. At the same time, regulated industries also opposed flexible instruments, seeing them as an additional regulatory burden (Stavins 2003). If the burden of moving to new approaches threatens to exceed already scarce resources, policy actors may not welcome flexible instruments (U.S. EPA 2001c). In this environment, introduction of flexible instruments will likely not be legitimized, which in turn will stifle the implementation of such approaches.

Many new approaches and instruments, being dependent on such politicized intergroup processes, will likely gain support when they are not

completely new but rather novel combinations of earlier regulatory practices and institutional components. Existing institutional practices not only create constraints to new policy approaches, but also enable new approaches to a degree that they offer a collection of already established practices that actors employ to adopt new approaches in ways that constitute an evolutionary, rather than a drastic change. Flexible instruments representing new approaches to environmental protection borrow aspects of order and legitimacy from conventional regulatory practices (Dietz and Stern 2002). This notion of regulatory reinvention signifies that even a considerable change is rarely a step from one course to a completely different course of action, but a rearrangement in the regulatory practice, the one that strongly depends on well-established policy patterns.

Environmental Accountability

Even when policy actors understand that the adoption of a particular policy instrument is dependent on its compatibility with extant standards and on the continuity with legal and regulatory traditions, they still need to have the capacity to ensure accountability and compliance with new instruments. Governmental capacity in ensuring compliance is a necessary condition for effectiveness of a specific governmental intervention (Lemaire 1998; OECD 1997; Andersen 1995, 2000). Instruments that are likely to provide a higher level of compliance and consequently a higher level of assurance of meeting policy goals are more likely to be introduced (U.S. Congress, Office of Technology Assessment 1995). Governments can increase their capacity in ensuring compliance, and the probability of introducing new flexible instruments, by preserving existing noncompliance provisions as a "safety net" for new instruments (Bressers and Huitema 2000, 75). This is done in case new flexible tools do not achieve pollution control or prevention goals. Introduction of flexible instruments is more likely if existing direct regulation requirements, provisions, and even penalties back them.

Although in many cases posed as complete opposites, both direct regulation and flexible instruments involve a hierarchical imposition of pollution control standards. These are fixed by law, rules, and regulations. Both types of tools must satisfy standards of fairness, accountability, and justice. Both require administration and monitoring, although their characteristics may be very different (Mann 1982). The traditional remedy for noncompliance has always involved the threat or the application of sanctions. Governments hoping to ensure accountability and provide compliance must convince reluctant regulated entities that violations will be detected and sanctioned, and that the costs of violation will exceed the costs of noncompliance (Mitchell 1994). Flexible instruments, while providing the regulated with the

means of increasing incentives for compliance, must create a framework of oversight and enforcement that will hold participants accountable for their activities, such as emissions, meeting deadlines, and providing information. A primary basis for accountability is accurate measurements and a verification of pollution emissions and discharges and the rigorous and consistent enforcement of penalties for fraud or noncompliance.

Accountability and predictability in the design and application of policy instruments are important factors for an effective flexible instrument. These features help create the right circumstances to encourage innovation and lower costs. For instance, with a pollution trading program, emission sources have an incentive to find better and lower-cost opportunities to reduce emissions. This incentive depends on long-term, predictable, and consistent rules that affect the economic value of emission reductions. In many cases this requires not only well-developed governmental regulations, but also a legislative action, which will bring a greater degree of assurance for the sources and better guidance to the regulatory agency. A regulatory agency must have the authority to introduce and sustain the flexible approach as well as ensure that it is procedurally fair and environmentally sound. The accountability factor gives the agency authority to impose and enforce sufficient penalties for polluting sources that do not comply with the rules of the program.

Implementation Aid

To this point, the focus of our discussion has largely been on institutional, structural, and procedural factors explaining the possibility of the adoption of new flexible instruments. The introduction of alternative policy tools also depends on how the government views the ability of traditional direct regulation to cope with persistent and emerging environmental problems. The more difficult it is for the government to achieve policy goals with command-and-control, the more likely direct regulation will be complemented with flexible instruments. The introduction of new flexible instruments in this case not only addresses the diversity of experience within regulated communities by reducing costs and burdens of compliance, but it also aims to increase an agency's capacity to implement policy and find improved ways to communicate with policy stakeholders.

A motivation for establishing new methods to deal with existing dilemmas is the development, recognition, and naming of a recurrent concern to which no existing approaches and strategies provide a satisfactory answer (Suchman 1995). The inability of command-and-control to cope with persistent problems is also what makes governments adopt flexible regulations. Thus, actors working with an existing set of standard operating practices

attempt to understand and diagnose problems and find solutions to them. By experimenting with and introducing flexible regulation tools, a governmental agency is also likely to prove very sensitive to the costs and benefits of such approaches for itself, and consider those policy instruments that will reduce or at least not add to the regulatory burden. Once these policy experiments are generalized into solutions, it is possible to establish which solutions are appropriate in which situations. Solutions found for one problem may then be diffused to other problems and contexts.

Because there are a variety of flexible instruments, regulatory agencies will prefer some instruments to others when considering whether a new tool increases or diminishes agency's own implementation capacity and effectiveness. For instance, with pollution trading schemes, especially cap-and-trade programs a governmental authority establishes a cap on pollution, which imposes an absolute restriction on the quantity of emissions or effluents permitted, thus allowing the price of emissions to adjust to the marginal abatement cost. A regulating authority's administrative costs include processing this information, reviewing it for completeness and accuracy, recording it, and undertaking enforcement measures in cases of noncompliance. The agency further requires new polluting sources to purchase permits directly from the market or the agency itself, which ensures that the level of emissions is within the allowed limit. Thus, flexibility is added to the process and the environmental protection goal can be maintained.

Agencies will choose flexible instruments as a way to address environmental concerns faster and further than direct regulations can (Dietz and Stern 2002). By introducing flexible instruments, governments open up a possibility to cultivate a policy and political environment in which public agencies, regulated entities, and other stakeholders accept the obligations for environmental problems and provide feedback to the government, thus participating in environmental governance.

The preceding discussion provides the foundation for identifying whether, how, and why governments introduce flexible instruments for environmental protection. When governments consider using flexible instruments, it is essential to understand the institutional context and practices in which these flexible mechanisms will function. The institutional context favors certain strategies and tools of policy because this context is determined to a large degree by existing or previous regulations and the standard operating procedures through which public regulations are developed and implemented. In the words of Mikael Skou Andersen: "the importance of the choice is not among abstract principles, but among specific institutional arrangements to implement them" (Andersen 1994, 27).

New flexible instruments are an evolving set of supplements to direct regulations. Consistency and coordination in the design and application of

new approaches are important factors for an even and effective adoption of flexible instruments. Instrument application for both polluting sources and regulating agencies at different levels can be less costly and time consuming if the rules are not overly complex or burdensome, and if new instruments may be well mapped onto the existing regulatory framework. The environment is more likely to be protected when new flexible instruments are clear and easily enforced. This in turn promotes public acceptance and confidence in the instrument as well as aids regulatory agencies in the development of regulations applicable to instruments' implementation and use.

Although it is understandable that factors, other than institutional, such as personnel, budget, commitment of officials, and so on, influence instrument development, institutional factors have a substantial influence given the similarity of environmental quality problems and the similarity of potentially accessible solutions (Lundqvist 1974; Jänicke 1992). In addition, even when a choice is made in favor of a particular policy instrument, it often takes a long time before this instrument can achieve a design that enables it to make an effective contribution to environmental policy goals. Therefore, attention to the development of original policies and instrument choice, to sources of policy provisions, to changes being made in policy goals, and to the institutional contexts is necessary to explain the rationales and likelihood for the adoption of new policy instruments. The following four chapters provide an analysis of the introduction of flexible incentive-based tools in air and water quality policy in the United States and Russia.

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CHAPTER 3

Clear Skies through Flexible Regulation

U.S. Air Quality Policy

The problem of controlling air pollution is one of the major tasks of all industrialized and urbanized countries in the world. How do different countries approach social problems of air quality? What strategies and instruments are used to reduce harmful impacts of societal activities on air quality? Air is a free circulating resource, or a common-pool resource, which makes it available as a vehicle for waste disposal and also makes it difficult to manage or privatize because it cannot be readily excluded, and therefore assigned to particular owners. However, unregulated free access to such a resource eventually leads to overexploitation of its capacities and deterioration of human health and quality of life. That is why direct regulation became a common response to controlling air pollution in many countries, not excluding the United States.

From a technical perspective, air quality policies are characterized by concentrated costs to be born by polluters and diffused benefits, as we are all breathing human beings. From a political point of view, focusing on the character of coercion and incentive and the probability of their use, clean air policies are regulatory in nature because the goal of policy is achieving particular behavior changes by those who contribute to pollution. Direct regulation, however, has major shortcomings. Costs of pollution control present a major issue to the regulated, and the ability of the government to effectively intervene to mitigate pollution generates considerable controversies about the tools of pollution prevention and control. What are the strategies that make air pollution control more cost-effective and efficient? What regulatory tools have been used in the United States? What explains the move toward the use of incentive-based and flexible tools?

In the United States, certain patterns are discernible in the development of air control strategies.[1] The most obvious trend was a changing focus of what is controlled. The extent of air pollution control efforts has expanded over the years as improved understanding, scientific knowledge, and public pressure have gradually brought a wide range of air pollutants to the attention of the policy makers and regulators. While unspecified air pollution control was the responsibility of the states, the need for greater coordination from a central agency and more specific policy prescriptions resulted in a transfer of many regulatory responsibilities to the U.S. Environmental Protection Agency.

The U.S. air quality policies rely heavily on health-based standards, which specify the acceptable concentrations of any pollutant in the environment. However, technology-based standards that require polluters to install specified pollution control equipment are also used. The developments in clean air policies demonstrate a pattern of drastically increased controls almost four decades ago, with a gradual relaxation of direct regulation provisions. In most cases, relaxation of policy provisions did not come in the form of flexible instruments, but rather in the form of extended deadlines and modified standards. However, almost all of the instances of flexible instruments choice came out of the EPA.

It would not be an exaggeration to say that direct regulation still serves as a basis for air pollution prevention and control in the United States, although significant developments in the use of flexible instruments have occurred. Beginning in 1974, the U.S. Environmental Protection Agency experimented with emissions trading, which eventually resulted in its Emissions Trading Program in 1986. The most important application made of flexible instruments for environmental protection has been the SO2 allowance trading program for acid rain control, established under the Clean Air Act Amendments of 1990. Many other programs emerged that offered not only provision of flexibility from the government to the regulated community but also reporting and performance requirements, in some instances based on a voluntary approach.

This analysis of clean air policy is an exploration of how and why particular approaches and instruments have developed and changed in the United States. It is less concerned with the virtues and shortcomings of policy instrument alternatives but rather with reasons and conditions of the adoption of various policy instruments. Table 3.1 summarizes the development of air quality regulatory approaches in the United States.

This chapter goes through four stages explaining the evolution of air pollution control legislation and regulations. First, a discussion of early attempts at air quality control serves to provide an historical outlook on the institutional configuration and government involvement in pollution control. Second, the struggles in the adoption and implementation of the Clean Air Act of 1970

Table 3.1 Evolution of EPA's Regulatory Approaches in Air Quality Policy

Year	*Regulatory Activity*
1971	EPA sets National Ambient Air Quality Standards for six common classes of pollutants
	EPA publishers initial New Source Performance Standards, no integrated permitting (netting) provided
1974	EPA establishes Prevention of Significant Deterioration (PSD) regulations, allows integrated permitting (netting) for modified sources in attainment areas. Industry and environmental groups file suits
1975	EPA revises New Source Performance Standards, limited integrated permitting (netting) is provided for modified points in a plant
1976	EPA establishes emission offset policy for major new and modified sources in non-attainments areas
1978	New Source Performance Standards regulation allowing netting are ruled illegal by the Circuit Court
	EPA establishes revised PSD regulations allowing "bubbles" for modified sources in attainment areas
1979	EPA revises offset policy and rules for non-attainment areas, and allows netting in such areas with approved State Implementation Plans. Industry files suit
	EPA proposes "bubble" policy for existing sources subject to State Implementation Plans
	Court decision upholds netting opportunities in attainment areas
	EPA establishes "bubble" policy for existing sources
1980	EPA broadens netting in attainment areas
1981	EPA announces liberalization of "bubble" policy for existing sources
	EPA allows greater netting in non-attainment areas. Environmental groups file suit
	NRDC files suit to challenge EPA regulations in non-attainment areas
1982	EPA publishes proposed interim Emissions Trading Policy Statement establishing general principles for "bubbles," offsets, and netting
	EPA initiates lead trading and banking program
	Circuit Court decision rules netting in non-attainment areas illegal
1983	EPA provides New Source Performance Standards regulation allowing limited "bubble" policy for new and modified sources

continued on next page

Table 3.1 *(Continued)*

Year	*Regulatory Activity*
1984	Supreme Court upholds EPA's proposed netting in non-attainment areas
1986	Toxic Release Inventory requires self-reporting of emissions
1986	EPA decides major emission trading issues. Air Emissions Trading Policy Statement integrates offset and "bubble" policies, and endorses use of "generic bubbles"
1988	EPA establishes 33/50 program as a voluntary partnership
1990	EPA establishes a marketable permit system for SO_2, under acid rain provisions of the Clean Air Act
1991	EPA issues policy on the use of Supplemental Environmental Projects in enforcement settlements
1993	EPA promulgates final rules for the Acid Rain Program EPA and the States develop and implement compliance-focused Environmental Management Systems (EMS)
1995	EPA initiates Project XL EPA issues Policy on Incentives for Self-Policing: Discovery, Disclosure, Correction, and Prevention of Violations, also know as Audit Policy
1998	EPA finalizes the Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone: the NO_X SIP Call. It establishes cap and trade program, to facilitate cost effective emissions reductions of oxides of nitrogen (NO_X) from large stationary sources
2000	EPA issues revised Audit Policy EPA finalizes a federal NO_X emissions cap-and-trade program, the Federal NO_X Budget Trading Program, aimed at reducing interstate ozone transport EPA issues position statement on EMS EPA establishes National Environmental Performance Track Program
2001	Circuit Court upholds to a large degree the establishment of the Federal NO_X Budget Trading Program
2002–2003	EPA provides an analysis and modeling of the Clear Skies Initiative
2002–2006	EPA initiates and establishes a strategy for achieving better environmental results through innovation and supports voluntary projects and partnerships with stakeholders

and its major approaches exemplify statutorily prescribed policy techniques and regulatory initiatives. Third, an exploration into policy developments after the 1977 Act was enacted demonstrates policy changes with regard to regulatory approaches. Finally, major policy innovation through the legislative action in 1990 follows to reflect the progress toward flexibility in law and regulations. The conclusion to this chapter underscores that the EPA was the architect of flexible instruments and the initiator of the legislative agenda. It also identifies common themes regarding the rationales of the shift toward flexibility, regulatory change, and general governance mechanisms.

POLICY LAUNCH: CONGRESSIONAL INTEREST AND STATE RESPONSIBILITY

National concern with air pollution in the United States started as early as 1955, when Congress offered financial and technical assistance to the states through the Air Pollution Control Act (Smith 2004). Table 3.2 demonstrates the development of air pollution control legislation in the United States. While the states were responsible for regulating air quality, the law authorized $5 million annually to the Public Health Service for research and technical assistance to the states (U.S. Congress, Senate 1970b, 249). Continued pressure by the states' delegations and the evidence provided by federal reports on air pollution problems generated an incentive for further federal action (Bailey 1998). The Clean Air Act (CAA) of 1963 became another effort to legislate air pollution control (Crandall 1983; Portney 2000). The act authorized the Secretary of the Department of Health, Education and Welfare (HEW) to take legal action against polluters causing interstate pollution. A belief that air pollution control was the constitutional prerogative of the states and local governments, however, restricted the options available to policy makers. The Public Health Service authorized with research responsibilities felt that "regulatory authority would threaten its reputation as an apolitical, highly professional, research-oriented organization" (Bailey 1998, 101).

Between 1965 and 1970, only eleven abatement actions had been initiated under the 1963 CAA at the federal level (Rosenbaum 1973). To improve the apparatus for enforcing pollution abatement, Congress passed the Air Quality Act in 1967. This act directed the Secretary of the HEW to establish Air Quality Control Regions and ambient air criteria, where the states would establish emission standards, based on these criteria (Krier 1971).

The act also authorized the Secretary of HEW to establish enforceable, uniform control levels for specific pollutants in various industries, where the responsibility for enforcing the standards was given to regional commissions (see Figure 3.1). Few states had any experience with this approach. For the

Table 3.2 Development of Air Pollution Control Legislation in the United States

	Air Pollution Control Act (1955) and Clean Air Act (1963)	*Air Quality Act (1967)*	*Clean Air Amendments (1970)*	*Clean Air Amendments (1977)*	*Clean Air Amendments (1990)*
Federal Power/ Authority	Very weak	Weak	Strong	Mixed	Mixed
Federal Role	Research Funding	State standards Research Funding	Federal standards Research Funding	Federal/State standards Research Funding	Federal/State standards Research Funding
Degree of Federal Involvement	Narrow	Widening	Wide	Wide	Wide
Policy Provisions	General Air Pollution	Industrial and auto emissions	Industrial and auto emissions Criteria pollutants New source requirements	Industrial and auto emissions Criteria pollutants New source requirements Prevention of significant deterioration Non-compliance penalty	Industrial and auto emissions Criteria pollutants New source requirements Toxic pollutants Permits Federal enforcement Emission trading
Regulatory Instruments	Not applicable	Not applicable	Direct regulation Technology Minimal flexibility	Direct regulation Technology Some flexibility	Direct regulation Technology Expanding flexibility

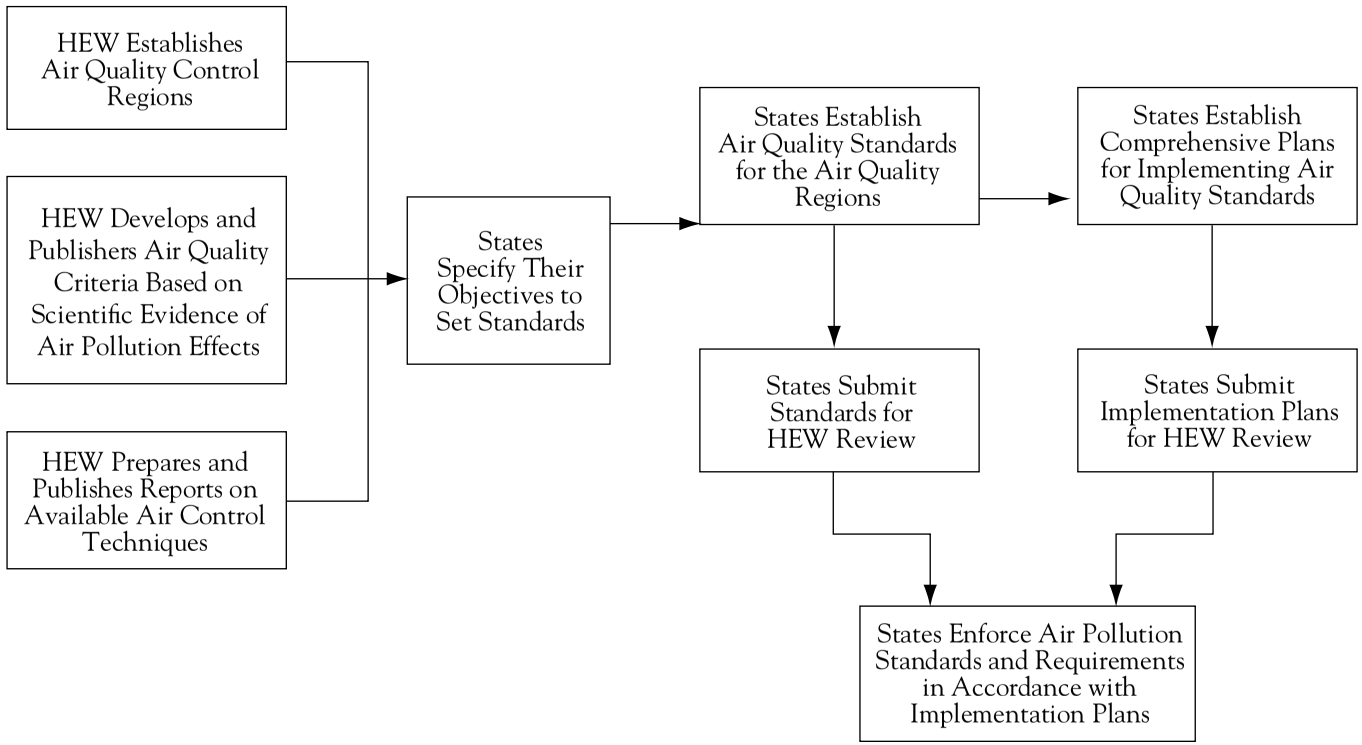

Figure 3.1 Air Pollution Control on a Regional Basis, under the Air Quality Act of 1967

most part, measures taken to prevent and control air pollution were designed simply to reduce visible emissions or abate obvious nuisances. In addition, by 1970, the federal government had designated only twenty-five of the Regions, and no state implementation plans were approved (U.S. Congress, Senate 1970, 1042–1094).

Demands for the federal government to play a greater role in controlling air pollution grew during the 1960s, as evidence of both the extent of the problem and the incapacity of the states to deal with it accumulated. The inadequacies of the existing air quality controls were challenged by the Secretary of the HEW, by the vice-president of the Public Health Service, by President Johnson, and by various industries including soft coal and automobile industry (U.S. Congress, Senate 1970, 965–1228). Without federal guidelines, states had an incentive to compete with each other by using a lack of pollution control to attract industries to the state. For this reason, many industries opposed strong regulation and federal involvement. However, many other industries argued for federal pollution controls. In the words of the then president of the Auto Manufacturers Association, Thomas Mann, presence of dangerous air pollutants "defines ambient air quality needs in terms of specific goals to be met. With these goals clearly established it becomes appropriate to project timetables for all industries or other sources of emissions so they can . . . devise methods of achieving goals" (U.S. Congress, Senate, 1970b, 234). The programs that started as research and financial aid to states were to become very specific guidelines to the states and industries imposed by the federal government to control air pollution.

POLICY ESCALATION: DIRECT FEDERAL CONTROLS

By 1969, it was clear that the Air Quality Act of 1967 was not being well implemented. The act had very complex rules for the federal, state, and local authorities, which were struggling to interpret and implement the provisions of the act. Over the years, the initiative of the Senate, and especially Senator Muskie, took the form of an incrementalist strategy, hoping to match the aspiration of air protection with the capabilities of implementing the requirements (Bailey 1998). However, in 1970, Congress decided to stop "losing the fight for life and lung . . . and put teeth into the fight for clean air" and introduced a drastically different approach to deal with air pollution (U.S. Congress, Senate 1970b). Environmental groups and labor unions also urged Congress to broaden and strengthen existing pollution control programs, develop national emission standards, increase federal authority in order to "stop the industrial blackmail to which workers are subjected,"

and improve the health of the population (American Federation of Labor 1970). Responding to environmental pollution concerns, President Nixon pushed for national emission standards and strict deadlines.

Efforts of the industrial lobby to relax provisions of the new legislation were based on the "unreasonably rigid and inflexible" standards, impossibility of developing the required technology in a few years, unfeasibility of "zero tolerance" to hazardous pollutants, fear of federal preemption, as well as fear of the ability of the states to establish even stricter standards (U.S. Congress, Senate 1970b, 716–787). Industry urged that the strict provisions should give some consideration to commercial feasibility. Industrial representatives argued that the "legislation that is unrealistic can only bring the credibility of the entire pollution control program into question" (Standard Oil Company of Indiana 1970).

Notwithstanding this strong industrial lobby, policy makers were much more concerned with the health of the population rather than with technical and financial feasibility. Ambient air quality standards were set at two levels: protection of public health and protection of public welfare (U.S. CAA 1970). Under these conditions, the EPA was to establish national air quality standards for six classes of pollutants: sulfur dioxide, particulate matter, carbon monoxide, photochemical oxidants, nitrogen oxides, and hydrocarbons (U.S. EPA 1972). Legally enforceable national emission standards formed the U.S. approach to stationary source control. However, auto emission regulations went even further and required a ninety percent reduction in hydrocarbon and carbon monoxide beginning with 1975 (U.S. CAA 1970).

Under the 1970 amendments, each state was required to control air quality through the State Implementation Plans (SIPs) to be approved by the EPA. No state standards could be less vigorous than federal standards (U.S. Congress, House 1970, 796). While the states were required to deal with the existing sources of air pollution, the EPA had to establish standards for new and modified sources and take over the compliance schedules if the states failed to produce, implement, and enforce the SIPs (U.S. CAA 1970). Senator Muskie stressed that while the federal government could not handle the task of air pollution control by itself, "State and Local governments did not respond adequately to this challenge. Enforcement had to be toughened. More tools were needed. The Federal presence and backup authority had to be increased" (U.S. Congress, Senate 1970a, 125).

The enforcement element of federal power was significant because it embraced federal preemption and emphasized the use of courts. The EPA could enforce state regulations, take over the enforcement under its own terms, or bring a civil action in federal courts against violators of federally approved implementation plans. However, if the agency failed to adequately

respond to air pollution problems, citizens could sue the EPA. A strong desire for due process gave powers of judicial review to the courts.

Bases for Direct Regulation

The process of adopting measures to control air quality was intensive, with the politicians telling the administrative agencies, industry, and special interests what must be done. The whole approach to air pollution control could be summarized in the words of Senator McIntyre: "We cannot delay. We cannot compromise. We must Act. A more flexible approach to the problem was attempted in 1967 with Air Quality Act. But we have learned much since then and all relevant evidence points to the conclusion that more stringent measures are essential" (U.S. Congress, Senate 1970b, 388).

Why did the United States pursue a command-and-control policy without considering its feasibility and effectiveness? One answer would be a demand from the public for a quick and strong action against air pollution. In ordering preferences on how to control air pollution in 1970, policy makers determined that the health of people was more important than the question of whether an early achievement of ambient air quality was technologically feasible. Senator Muskie was firm on the position that "the deadline is based not . . . on economic and technological feasibility, but on considerations of public health" (U.S. Congress, Senate 1970b, 239).

However, another explanation for command-and-control would lie in the relationship between means and ends of air pollution policy. Main strategies available to the government to cope with air pollution are direct regulation, economic incentives, or informational tools. Policy makers usually first determine the goals and objectives and then look for means or instruments to be used to achieve these goals. In developing air quality controls in 1970, the government stressed industry's own capacity to solve pollution problems and a capacity of an expert agency to formulate appropriate regulations and submit recommendations to Congress to make further policy decisions (U.S. Congress, Senate 1970b, 299).

Policy makers believed that industry was presented with challenges before and coped with them, so there was no need to relax the provisions. The approach was one of going beyond available means "to establish a new . . . and absolute objective" (Lundqvist 1980, 61). Some concerns regarding the strictness of deadlines and economic feasibility were raised. However, the determination of policy was based on a principle that Congress would tell industry what to do, rather than wait until industry told Congress it could comply (U.S. Congress, Senate, 1970b, 238). In addition, the HEW administration was also very much supportive of stricter regulations. The

under secretary of HEW was convinced that there should not be any economic—tax—incentives for those polluters who were doing a poor job in controlling pollution. Although the Tax Reform Act included some provisions to that effect, giving the possibility of write-offs for installation of control devices, new regulatory measures were considered much more effective than a fast write-off (U.S. Congress, House 1970b, 1380).

The rationale for direct regulation was that the new law would take into consideration technological and economic feasibility where necessary, but not at the expense of public interest. Representative Hechler explained this situation: "I doubt whether Columbus would have succeeded had Queen Isabella stressed practicability, technological, and economic feasibility" (U.S. Congress, House 1970a, 883). Failures of previous policy were considered to a large extent a result not of technological unfeasibility, but rather of organizational problems at the federal level, and the National Air Pollution Control Administration's lack of aggressiveness in implementing the law (U.S. Congress, House 1970a, 804).

In essence, three factors stand out in the Act of 1970: public pressure, belief in industrial capacities to comply, and administrative capacities to control. Faith in governmental capacity to find answers to difficult environmental and economic problems appeared, in the words of Senator Muskie, "on the basis of the knowledge [Congress has] gained from existing air pollution control legislation, on the basis of . . . studies, and on the basis of what Americans have been telling . . . the Senate about their determination to overcome the obstacles to clean air" (U.S. Congress, Senate 1970b, 223). The necessary components for achieving national goals and aspirations were the creation of an environmental super-agency, involvement of courts, and provision of multiple institutional channels for public participation. These factors in 1970 led to selecting a policy aimed at immediate adjustment of present conditions to policy goals rather than to sequential adjustments of policy to increased capabilities to implement policy or more flexible air quality control.

REGULATORY RESPONSE

Regulatory policy refines, interprets, and in some cases improves on the legislative provisions. "It is in the crucible of administrative politics . . . that public policy is mainly hammered out . . . among appointed rather than elected officials" (Rourke 1969, vii). The first attempts at the introduction of flexible instruments were the result of regulatory experiments rather than legislative provisions.

Initiating Flexible Controls

The EPA became the agency that assumed primary responsibility for setting air quality standards and for ensuring that the states enforced those standards. Responding to the problem of "regulatory capture," the agency was guided by strict deadlines and clear goals that both constrained the EPA's discretion and limited polluters' flexibility (Layzer 2002). For the first years, the EPA was constantly haunted by court orders to make implementation more consistent with legal interpretations of the legislative intent. While the context of policy development left administrators with little choice but to try to implement the intentions of the 1970 Act, the EPA still experimented with innovative approaches.

The earliest efforts to incorporate some flexibility into clean air regulations demonstrate an important role administrative agencies play in setting the stage for the use of flexible instruments. Standard setting for new and modified sources serves as a good illustration of this process. Section 111 of the CAA of 1970 gave the EPA the authority to set binding emission standards for all new and modified emission sources of common air pollutants. New Source Performance Standards (NSPS) reflected the best technological system of continuous emission reduction. The standards were to be set on an industry-by-industry basis by the EPA Administrator, who must take costs, energy requirements, and other factors into consideration (U.S. CAA 1970). However, acknowledging economic[2] and environmental[3] rationales, the EPA used its authority and discretion to include limited flexibility in the implementation of the statutory provisions. The EPA attempted to use the existing regulatory framework to allow for integrated permitting—netting—for modified sources within an existing plant.[4] Netting would have allowed modified points in a plant to avoid the NSPS requirement if their emission increases were offset by decreases elsewhere in a plant. The EPA's original regulations interpreting Section 111, promulgated in 1971, repeated statutory definitions of "stationary source," "facility," and "modification" and did not contain any version of the netting concept (36 FR 24877, 1971). However, starting in 1974, in response to industry proposals and letters from the Department of Commerce, the EPA declared that emissions from an altered existing facility could be offset by a decrease in emissions from elsewhere in a plant (40 FR 58416, 1975).

The Agency rejected industry's demand to allow for netting in a completely new facility constructed within an existing plant. New facilities would have to comply with the technology requirements of the NSPS. However, the Sierra Club challenged netting for the modified facilities in the court. As a result, netting was ruled illegal by a federal court in 1978 (*ASARCO, Inc. v. EPA 1978*). Judge Skelley Wright claimed that the

regulations incorporating netting must be rejected as inconsistent with the language of the act "and cannot be justified by any alleged need for flexibility" (*ASARCO, Inc. v. EPA 1978*). It is important to emphasize that while industrial or environmental interests played a role in the development and use of policy instruments, the exercise of discretion and the direction of policy development were determined by the administrative and the judicial institutions that ultimately decided on the introduction and upholding of a flexible approach to pollution control. Although Congress was the source of policy provisions for air quality controls, policy innovation was centered in the EPA.

Interpretive Policy Rulings

The Prevention of Significant Deterioration (PSD) program serves as another illustration of the introduction of flexibility into governmental regulations. The legal language of the PSD program differed significantly from the provisions for new industrial sources. That allowed the EPA to develop definitions conducive to increased flexibility for sources, which were later adopted by Congress in amendments to the Clean Air Act in 1977. The use of integrated permitting appeared to be a logical policy, since the PSD program's major concern was to avoid increased emissions that could result in air quality deterioration. Thus, the EPA regulations allowed for integrated permitting for modifications, but not for new facilities in the PSD areas (39 FR 42513, 1974). Major new and modified sources still had to comply with the "best available control technology" (BACT), which was as stringent as NSPS requirements, but technology forcing was not the main point of the PSD program. The provisions themselves fit the existing structure of regulation and provided flexibility to the regulated.

The EPA continued experimenting with flexible approaches and introduced interpretive policy ruling under which construction of major new or expanded stationary sources of air pollution could, under certain conditions, be allowed in areas that have not attained the national ambient air quality standards (41 FR 55524, 1976). By formulating an offset policy for the non-attainment areas, the agency tried to avoid imposing politically unpopular bans on economic growth, while at the same time attempted to achieve a required air quality level (Liroff 1986; ELR 1977). According to the Administrator Douglas Costle, the agency "recognized the need for a national policy with enough flexibility to permit growth in a manner consistent with . . . ultimate objectives of meeting ambient air quality standards" (U.S. Congress, House 1977a, 3549). On the one hand, the CAA of 1970 as interpreted by the courts subordinated demands for industrial expansion to the need for attaining and maintaining clean air (*Fri v. Sierra Club* 1973;

Sierra Club v. EPA 1976). On the other hand, significant portions of the population in the affected areas were inclined to see economic stagnation as an unbearable price to pay for achieving this goal. Taking into account these two aspects, flexible regulations arose in connection with the agency's implementation of regulations governing preconstruction review of new or modified stationary sources.

One key feature of the EPA's regulations was that they allowed privately arrived at arrangements among different sources and owners. This provision fostered a development of a private market in "emission right." Even though these regulations limited the scope of the market by prohibiting banking of extra emission "credits," it represented one of the first instances in which the notion of using market instruments to encourage emission reduction beyond the applicable requirements had appeared in the regulatory scheme. This case would be later taken up in the legislative agenda. By promoting these rules, the EPA not only introduced flexibility at the regulatory level, but also served as a policy initiator. In addition, while providing certain degrees of flexibility in the implementation of the act, the EPA did not have to significantly change provisions established by the law, thus carrying out the legislative intent.

POLICY CUTBACK: STRUGGLES OVER THE COSTS

The Clean Air Act amendments of 1977 were passed after seven years of intense struggle with the provisions of the 1970 Act. Regulatory initiatives to introduce some flexibility and continuous litigation to modify policy provisions resulted in a less drastic approach to air pollution control. Complaints brought by industry about technological and economic unfeasibility were given particular potency by the energy crisis and growing economic problems of the mid-1970s. Constant evaluation of implementation brought about a changing set of ideas, which were also influenced by an evolving body of new scientific and policy information about air pollution (Hays 1998). Consequently, there was some policy retrenchment characterized by a decreased saliency of air pollution issues and less dramatic adjustments in policy.

An industrial lobby took an especially strong stand on the implementation guidelines. Industry utilized its relationships with the Department of Commerce, the Federal Power Commission, and the Office of Management and Budget. A major instrument of the industrial lobby was the National Industrial Pollution Control Council, established by President Nixon, composed of the representatives of corporate firms (Bailey 1998; Hays 1998). The council provided information to the administration and had a great influence on policy.[5]

During a round of hearings held by the Senate Subcommittee on Air and Water Pollution, representatives of industry argued that: "Attempting to meet [air pollution] standards is an enormous economic burden. Unless they are modified, they will result in further plant closings with attendant unemployment" (U.S. Congress, Senate 1972, 616). Industry demanded postponement of the emission standards or a relaxation of the standard stringency, but did not demand any market-based approaches. In many cases, industry opposed economic instruments upfront: "Congress should reject a tax or fee on emissions . . . [because] a source that is fulfilling a compliance schedule would have its ability to continue with the schedule impaired by a requirement to divert to the payment of penalties those funds which are necessary to achieve the mandated levels of control" (American Mining Congress 1977, 4160).

Taking into account these demands the law gave "industry 2 additional years . . . to perfect evolving technologies" and provided waivers "to encourage the introduction of new engine and new emission systems" (U.S. Congress, Senate 1977b, 996). It is important to emphasize that the demands expressed by industry and the responses by compassionate legislators involved a *quantitative* change in the existing regulatory framework, such as extending deadlines and relaxing standards, rather than a *qualitative* change to move to a different approach.

While Senator Garn attempted to raise the issue of pollution charges "as an alternative to the absolute standards approach that has characterized so much of environmental protection in the United States," his proposal did not receive consideration (U.S. Congress, Senate 1977b, 1192). In addition, several bills were introduced to allow individual sources to petition the EPA for variances where environmental benefits did not justify economic and social costs imposed by environmental controls. Other bills proposed a tax approach to pollution control as well. These bills, however, did not receive any floor action (U.S. Congress, House 1977c, H.R. 2044; U.S. Congress, House 1977c, H.R. 3577).

The industrial challenge to the act was based on the premises of overregulation and job loss. Labor unions, on the other hand, while willing to work out implementation agreements, were unwilling to compromise the needed regulatory schemes (Hays 1998). In addition, the activities of environmental groups, although outweighed in financial and technical resources, were able to mobilize the public for the cause and exercise significant leverage. Demands for greater commitment to control air pollution were prompted by growing evidence about pollution-related cancer, the combined effects of two or more pollutants, the long-distance transmission of air pollutants, and the links between air pollution and climate change (Bailey 1998).

These perspectives brought about some of the heated controversies involving such questions as the admissible types of evidence, the conception

of air as a finite resource, and the mechanisms to address air pollution. On the one hand, there were those who advocated precautionary principle, stronger standards, and stricter deadlines. On the other hand, there were those who argued that conclusive proof of harm should be established before action is justifiable, and that costs and technical feasibility should be taken into consideration (Hays 1998). The CAA of 1977 addressed many of these problems as well as problems arising out of the ambitions of the 1970 Act by relaxing controls and extending compliance deadlines. While it did not alter the basic structure of the CAA of 1970, it did represent a move away from unrealistic expectations of the previous law.

Relaxing Controls without Imparting Flexibility

In searching for ways to deal with tough standards, Congress legislated a provision that initially started as the EPA interpretive ruling in 1976. It was a provision that allowed new sources to be constructed in non-attainment areas as long as they offset increases in air pollution (U.S. CAA 1977). The non-attainment provisions of the 1977 Act implied that in calculating levels of pollution, the total pollution loads should be considered and not simply the percentage reductions from a given historic level. The requirement was to not simply reach air quality levels but to also maintain them in the face of economic growth. This was the only provision that directly involved some degree of flexibility. While Section 312(c) of the act required the Administrator of the EPA to study the possibility of cost-effectiveness in regulations and to report to Congress whether existing strategies were adequate to achieve the goals of the act, no specific direction was given to the EPA (U.S. CAA 1977).

Moreover, some of the new provisions emphasized direct regulation practices. Representative Waxman claimed that the act could have asked for even more stringent controls especially with regard to mobile sources, but "because of enormous lobbying pressure, this legislative goal could not be achieved" (U.S. Congress, House 1977b, 334). Representative Rogers, one of the main sponsors of the 1977 amendments, claimed: "We have granted waivers, we have given extensions, and we have written in flexibility to consider the economy and energy and the technology to meet goals and standards," but the new scientific evidence had shown that more stringent controls on air pollution were necessary (*Congressional Quarterly* 1997, 641). Senator Muskie was even more aggressive in his defense of the stringent controls: "The health of the people can wait no longer . . . We do not want to know what cannot be done; we want to see what can be done . . . We are tired of their [industry] foot dragging. We are tired of their constant effort to solve the problems by lobbying Congress instead of developing new technology" (U.S. Congress, Senate 1977a, 343).

Congress instructed the EPA to consider four specific additional pollutants.[6] States were allowed to apply stricter standards. In addition, the Prevention of Significant Deterioration and the nondegradation provision were explicitly formulated to provide for protection against harmful environmental effects. These were added to ensure that major emitting facilities would "not consume the entire regional air resource thus barring any future growth" (U.S. Congress, Senate 1977b, 927). The law divided the country into three classes of air quality districts. Each would have permitted some deterioration—Class I permitting the least, and Class III the most—up to the level of secondary standards. The key aspect of this provision was to limit the possibility to move from more polluted areas to less polluted areas.

Finally, a delayed compliance penalty expanded the direct regulatory tool kit. The reasoning behind such a penalty was that if polluters did not comply by the specified date, they would be permitted to continue to operate without a legal action taken against them, but with a fine imposed daily, equal to the amount of the economic gain for noncompliance. The need for such a penalty arose out of the concern for program effectiveness. For many regulators and environmentalists, litigation meant stalling the implementation, as it was cheaper than compliance. The aim was to make polluters pay for noncompliance. As Representative Waxman stated: "No longer will . . . our major utilities, or our large refineries, be able to reap an economic windfall from polluting the air. No longer will they find it cheaper to send their lawyers into court instead of purchasing and installing the necessary pollution control equipment" (U.S. Congress, House 1977c, 336).

To the economists, a polluting source should be confronted with a cost, such as a fee, and then be free in determining what to do with cleanup in order to avoid the cost. To legislators a noncompliance penalty was the most effective instrument to enforce clean air standards. Senator Stafford in particular emphasized that "the delayed compliance penalty provision will provide a significant incentive for compliance while assuring that noncompliance will not result in unwarranted closing down of energy and other facilities" (U.S. Congress, Senate 1977a, 346). To policy makers, the major issue was equity. With the introduction of such a penalty, however, attention shifted from technological innovation and incentives to reduce pollution to the enforcement side of the problem.

The effort to improve regulation with a noncompliance fee, attention to individual sources, and introduction of new technologies gave a new context to air policy. However, some questions—such as: Could these mechanisms and instruments generate enough stimuli for the private sector to comply? How could more socially desirable technologies be achieved more rapidly?—were not fully addressed. The basic message from the legislature was, as Senator Muskie put it, "This law will use as the basic regulatory mechanism the one logical tool which is available for protecting the environment. This law will

establish environmental protection . . . as a price for new economic activity" (U.S. Congress, Senate 1977a, 342).

EXPANDING FLEXIBLE REGULATIONS

After the amendments of 1977 were enacted, the EPA found itself facing both some room for flexibility and detailed provisions of the law. On the one hand, the provision for offsets, and possibility of incremental pollution in PSD areas as legislated made it easier for the EPA to implement flexible approaches. On the other hand, new standards and technological specifications were prescribed. The agency met the need for greater flexibility with the interim strategies and innovative methods of regulation to attain cleaner air. While the states, environmentalists, and industry challenged some of these new regulations, the EPA expanded the range of incentive-based tools in air quality policy.

From Interpretive Rulings to Emissions Trading

While the EPA struggled its way to introduce some flexibility for existing and new emission sources, it had to manage the controversies within and outside the agency itself. Agency reformers faced challenges from those administrators who opposed flexible methods on the grounds of undermining the intent of the law, enforcement efforts, and placing additional burden on regulators (Levin 1982; Liroff 1986). Outside the agency, regulatory innovators had to struggle with three opponents to proposed flexibility. First, the EPA had to overcome the initial reluctance of state regulators to take unfamiliar responsibilities, while dealing with conventional demands. Second, many industries suspected innovation in regulation as an extra burden or as an expansion of regulation. Finally, it was environmental groups that treated introduction of flexibility as a betrayal of clean air policy intentions. However, in its attempt to introduce flexible instruments, the EPA sought to uphold the rule of law while providing enough flexibility for industry to have an incentive to abate pollution and introduce innovations. The main trend in the EPA's regulations issued since 1979 was broadened eligibility of areas and dischargers for emissions trading.

The "bubble" policy evolved from the desire of some EPA officials and some industries to find less expensive and more efficient ways for existing sources to comply with the requirements of State Implementation Plans. The "bubble" concept treats a source with multiple emission points as an aggregate of all emissions from the source. Emission reductions may be abridged on those plant components that are most expensive to control and correspond-

ingly increased on those emission points that are least costly to clean up. Sources would also be free to adopt a different set of controls on emission points as long as an alternative control strategy does not delay compliance with statutory deadlines or have an adverse impact on air quality.

The agency established the "bubble" approach in its 1978 regulations governing the Prevention of Significant Deterioration of air quality in attainment areas under the amendments of 1977 (43 FR 26388, 1978). Under these rules, a modification of one or more facilities within a source would not trigger rigid technology requirements as long as no net increase in emissions would occur (43 FR 26407, 1978). These regulations provoked a second round of legal struggle about the "bubble" policy. In addition, environmental groups challenged a number of regulations that allowed extensions and exemptions, while industry contended that the EPA was regulating too much. The challenges to the legality of the proposed "bubble" policy were resolved in 1979 in *Alabama Power Co. v. Costle*, where the D.C. Circuit court upheld broadening of netting opportunities in attainment areas. The court stated that physical or operational changes within a major source that did not result in a net increase in emissions were not subject to the PSD requirements. The central components of the EPA's incorporation of the "bubble" concept into its PSD regulations thus received firm judicial approval.

"Bubble" Policy and Its Challenges

The cornerstone of the EPA "bubble" policy was a decision to allow "bubbles" in regulating *existing* sources under the State Implementation Plans (44 FR 3470, 1979). Initial proposals were pushed by the Office of Planning and Management in 1977, whose principal responsibilities were in evaluating and improving the agency's programs and regulations (ELR 1980). The EPA targeted the domestic steel industry for special enforcement efforts because this industry, together with utilities and smelters, were major sources of noncompliance with CAA requirements (U.S. Congress, Senate 1978a, 88).

The agency established a task force to assess feasibility of the "bubble" concept and suggest an approach for implementing it. To ensure that the adoption of the "bubble" concept did not undercut the enforceability of emission controls or adversely affect environmental quality, the EPA set forth a number of protective conditions based on legality, enforceability, economic efficiency, and environmental acceptability (U.S. EPA 1978; Crandall 1983). The policy statement emphasized that compliance with these requirements was a prerequisite for EPA approval of a "bubble-based" alternative emission reduction strategy. To accomplish those, the agency proposed that only sources in compliance or on a compliance schedule would be allowed to use "bubbles." In addition, compensating for increases in hazardous pollutants

with decreases in nonhazardous pollutants could not be permitted. Regulated industries would be responsible for quantifying emissions and demonstrating that their proposed emission reduction alternative was equivalent to standard plans of abatement (44 FR 3740, 1979). This was an important restriction because it demonstrated that flexible instruments would be treated as alternatives to original regulations. That meant that regulators could continue to rely on existing provisions in cases where new ones were delayed or violated. The final "bubble" policy ruling allowed for "bubbles" over multiple plants, and some extension in deadlines and trades (44 FR 71780, 1979).

A major impediment to the proposed "bubble" policy was a delay by the EPA in approving individual proposals as written into the State Implementation Plans. To prevent enormous complications and innovation stall, the agency, prompted by New Jersey's attempt to write down "generic bubbles,"[7] started liberalizing policy and approved several changes to streamline administrative review of "bubbles" to make them more readily available (46 FR 20551, 1981). The EPA approved "bubbles" in non-attainment areas on conditions that they would apply reasonably available control technology, as required by the statute. A stricter approach to sources in non-attainment areas thus was undertaken to ensure reductions in emissions and attainment of standards (45 FR 52676, 52697, 1980). Further, the agency provided a delayed deadline for compliance in those "bubbles" that produced greater environmental benefits than compliance with conventional regulations (Liroff 1986). The 1980 regulatory reform conference at the EPA succeeded in promulgating the innovations. Not only the rules were liberalized but also the staff working on the "bubble" policy and budgeting for assistance had increased (Levin 1982). As a result, the EPA's Regulatory Reform Staff proposed to consolidate all innovative approaches into one document, joining together all forms of netting, "bubbles," and offsets.

An interim Emissions Trading Policy Statement was slow to appear in the Federal Register due to Reagan administration's delay in appointing EPA staff who were less familiar with the innovative approaches. However, the EPA pursued "bubble" policy and emphasized that the intent of Congress was that states were to balance environmental and economic concerns (46 FR 16280, 1981; 46 FR. 50766, 1981). The agency wanted states to develop their own trading rules, as long as emission reductions were permanent, and substituted trading for technology in meeting reasonably available technology standards (47 FR 15076, 1982).

The Natural Resources Defense Council challenged this decision in court. On August 17, 1982, a three-judge panel of the Court of Appeals for the District of Columbia Circuit overturned the EPA's redefinition of a "source" for non-attainment area programs in *Natural Resources Defense Council, Inc. v. Gorsuch* (ELR 1982). The question was whether emissions

trading could be used to exempt from the Clean Air Act new source review requirements those industrial plants that were located in non-attainment areas. The court replied in the negative because the congressional mandate to clean up areas with polluted air was clear and not readily amenable to compromise. Based on ASARCO and Alabama precedents interpreting the "bubble" concept to certain Clean Air Act programs, the court stated that the "bubble" policy was permissible in programs designed merely to maintain existing air quality, but held that it was "inappropriate" in programs enacted to improve air quality (ELR 1984).

The EPA, supported by industry, sought to review the District Court ruling by the U.S. Supreme Court. In a seminal case of *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc*, the Court stated that "the power of an administrative agency to administer a congressionally created . . . program necessarily requires the formulation of policy and the making of rules to fill any gap left, implicitly or explicitly, by Congress" (ELR 1984, 20509). The Court held that it had long been recognized that the principle of deference to administrative interpretations and regulations should be given to the agency's construction of a statutory scheme it was entrusted to administer (*Chevron U.S.A., Inc. v. Natural Resources Defense Council* 1984). The Supreme Court upheld the "bubble" policy in non-attainment areas, and signaled that when a challenge to the agency's interpretation of a statutory provision was centered on the wisdom of the agency's regulations, rather than on a reasonable choice within a gap left open by Congress, the challenge must fail.

In announcing its final policy and calling for widespread adoption of the "bubble" concept by existing air pollution sources, the EPA took a major step toward harmonizing pollution control with economic principles (51 FR 1986). The lead phase-out program, in which the EPA established credit trading and banking, serves as a good example of the regulatory innovation.[8] The policy also represented a noteworthy attempt by the agency to introduce flexibility and individual initiative into its regulatory program at minimal or no environmental cost.

Foundations of Flexible Regulations

The implementation of the 1977 Act embodied several steps toward flexibility that the EPA undertook. One of the factors was change in the institutional context between 1970 and 1977. While in 1970, there was no coherent environmental bureaucracy, by 1977, the EPA acted as a powerful central environmental administration. The EPA's commitment to policy goals and development of regulations was crucial in determining policy change. As the agency developed its final Emissions Trading Policy Statement, it undertook

specific steps to ensure that emissions trading could continue to help correct command-and-control's shortcomings, as well as eliminate many weaknesses that were evident in flexible approaches themselves.

Every step, however, came after a struggle with opponents to flexible regulations. Giving more flexibility to industry meant giving, at least initially, an increased administrative burden to the states, which were ultimately responsible for writing rules on emission trading. Problems with implementation of trading were intertwined with problems of data deficiencies, unclear definitions of regulatory requirements, and many other elements of traditional command-and-control strategy (Liroff 1986). Environmental and industry groups troubled by the regulatory changes challenged the agency's decisions in courts. However, many of the innovations proposed by the EPA were upheld in courts. The Supreme Court decision in 1984 especially supported the authority of a regulatory agency to interpret the law to allow for the flexibility in air control techniques.

The EPA evolved its view of emissions trading from a cautious offset regulation in 1976 to a proposal of emission trading and emission reduction credits on a larger scale. It would be an overstatement to say that the agency began to substitute economic instruments for the traditional regulation techniques because the federal-state air pollution program continued to be one of the administratively imposed standards. However, the agency began to use an existing regulatory framework as a map on to which it placed innovations, thus trying to achieve several important goals. By doing this, the agency pointed to new directions in air quality control, yet preserved the validity of compliance through enforcement.

POLICY STRIVE: FLEXIBILITY IS WRITTEN INTO LAW

The CAA Amendments of 1990 can be seen as a result of a decade of congressional struggles about various elements of revisions. The outcome of the act was a significant change in regulatory strategies. Emissions trading in the acid rain provisions allowed for flexibility, which was statutorily fixed. Enactments prior to the 1990 Act made minor adjustments in policy. Some of the deadlines were extended by the Steel Industry Compliance Extension Act of 1981, and further research was initiated by the Acid Rain Precipitation Act of 1980. President Reagan's strategy to change administrative procedures to incorporate cost-benefit analysis was ineffective because the previous law specifically prohibited taking costs into consideration with regard to the ambient air quality standards.

The stalemate in Congress over clean air reforms was broken at the end of the 1980s with the election of a new president, new Senate leader-

ship, and a growing saliency of environmental issues. Willing to translate his election claims as an environmental president, President George Bush made amendments to the CAA his priority. He sent to Congress his administration's proposal for new legislation in 1989 and signed the Clean Air Act (CAA) in November 1990 (U.S. Congress, Senate 1993).

Flexible Approaches

The act was so complex that it required the EPA among other things to issue more than 175 new regulations. The act embodied several progressive and creative provisions in order to effectively achieve air quality goals and regulatory reform expected from these far-reaching amendments. It promoted innovative technologies, the use of clean low sulfur coal and natural gas, encouraged the use of market-based principles and other innovative approaches, such as performance-based standards, and emission banking and trading (U.S. CAA 1990).

Emissions trading in the acid rain provisions, in the words of Representative Sharp, was a "dramatic departure from the command and control strategies of past environmental laws" (U.S. Congress, Senate 1993, 1206). However, there were two lines of opinion with regard to the marketable permits provision. To some, emissions trading was a strategy to improve managerial choice dominated by the same regulatory style. Moreover, some policy makers referred to the acid rain provisions as emphasizing regional fairness, rather than economic effectiveness (U.S. Congress, Senate 1993). However, to many policy makers from northeastern and western states, and even some environmental groups, including the National Wildlife Federation and the Environmental Defense Fund, emissions trading was a cost-effective flexible tool (Dowie 1995). In addition, Senators John Heinz and Timothy Wirth initiated a study, *Project 88,* to investigate market incentives (Stavins 1988). Emissions trading was going to "create a cleaner environment without imposing undue hardships or unbearable costs on any one industry or any one segment of . . . society" (U.S. Congress, Senate 1993, 1304).

One of the major elements of emissions trading was a shift from standards based on concentrations to standards based on quantities. Without quantitative limits, emissions trading would be relatively meaningless (Hays 1998). Congress itself allocated allowances per ton of SO_2 emissions to electric utilities. Allowances would not represent a cost to the government, but rather could represent an income to utility. Allowances were not given the status of property rights, and industries were not granted full flexibility but rather were offered another option on how to comply with the standards. In Senator Max Baucus's words: "Allowances are but the means of implementing an emissions limitation program . . . designed

so that [they] will be treated in part like economic commodities" (U.S. Congress, Senate 1993, 1034).

Two important elements that may be overlooked in the 1990 Act are the cost-benefit analysis and the provision for flexible instruments in the State Implementation Plans. The act required under Section 312 a "comprehensive analysis of the impact of this Act on the public health, economy, and environment . . . [where] the Administrator should consider the costs, benefits, and other effects associated with compliance with each standard" (CAA 1990). Section 110 of the CAA authorized the use of economic incentives such as fees, along with auctions of emission rights (U.S. CAA 1990). The law provided for additional flexible instruments, but it neither specified them in detail, nor established a clear guideline.

A key feature of new administrative strategies was that polluting sources had to acquire permits to emit from the states with implementation oversight from the EPA and citizen groups. The proposal for permits came from the EPA, which it submitted to the White House. Through the permit fee provisions, this program augmented states' resources to administer pollution control programs (U.S. EPA 2002a). Such a comprehensive permit strategy was borrowed from water quality permits that were established in 1972. This begs the question: Why was a permit scheme established for water quality control in 1970s, yet it took twenty more years to introduce permits in air pollution control? It was mainly because policy instruments are usually modeled on the previous strategies. In air quality policy, regulation was based on state implementation plans and ambient standards. The federal government established national air quality standards and provided guidelines for the states to develop implementation policies, but was not responsible for writing national air quality permits. However, in water quality policy, as the next chapter demonstrates, the precedent for permits at the national level had been set as early as the 1899 with the Refuse Act.

The CAA of 1990 also updated civil and criminal penalties for violations, which brought the act itself on the same page with other environmental statutes. However, four crucial issues remained: standards, technology, scientific information, and costs. Previously, standards for air quality were based on the criteria document, that is, effects of specific pollutants and acceptable thresholds. The 1990 Act reformed this approach to standards by setting a cap on emissions. Second, following the strategy of the Clean Water Act, Congress specified 189 air toxic pollutants to be controlled by the EPA. Toxic pollutants were to be controlled by technology standards rather than scientific assessment (U.S. CAA 1990). Moreover, Congress created another "market" instrument for the toxics—consumer knowledge. It required each source to report toxic emissions annually and make data available to the public.

Old Concerns, New Instruments

The role of science, technology, and economics received varied attention in the act. Congress believed that stimulation of new control technologies created market opportunities throughout the producer side of the economy. An environmental market could expand economic opportunities in generating and expanding "environmental economy" (Hays 1998, 252). A technology approach prevailed over a risk assessment approach. First, there was an issue of acceptable risk. Second, there was an issue of how risk can be calculated. Finally, there was an issue of an adequate margin of safety, one to be accounted for in the future accumulation of knowledge.

The role of science was more limited than the role of technology. When Congress made policy decisions about acid rain, advocated by President Bush, and when budget limits demonstrated that no more research could be funded for fiscal year 1992, scientific information was driven out of the picture. A $600 million acid rain program provided no clear guidance and resulted in intense disputes over the complexities of knowledge. Congress established a strategy to revisit the acid rain program later. Moreover, the introduction of tradable emissions was a compromise on the acid rain issue, where scientific uncertainty and stringency of regulations were balanced (Bailey 1998). Opponents of acid rain provisions claimed that the National Acid Precipitation Program did not yield results that would support stringent acid rain control requirements (U.S. Congress, Senate 1993, 1370). Thus, some policy makers believed that the provisions of the act were not supported by sound scientific information, and more regulation would mean only more governmental spending and a consequent deterioration of the economy (U.S. Congress, Senate 1993, 731-760).

Economics played a similarly limited role. While economists focused on the costs of air pollution control, environmentalists emphasized the benefits. Industry saw the passage of the act as a complete disaster. Some economists stressed the necessity of establishing marketable permits not only for acid rain provision, but also for hazardous air pollutants and urban air quality control (U.S. Congress, Senate 1993, 1367). However, Congress, rather than economists or environmentalists, balanced costs and benefits in the political arena. Some congressional representatives emphasized the enormous costs that the act would invoke, however others emphasized the costs of not cleaning the air (U.S. Congress, Senate 1993, 1115, 1180, 1222). The result was an act that struck a balance: the public interest in healthy air was significant, as was the opportunity to measure economics against control requirements.

In general, the law of 1990 did not create new objectives, but mandated the implementation of old ones in an improved way. The marketable

permit in the acid rain section was one of the major parts of the new law. However, cost-effective techniques were not built into other provisions of the law. Congress was less interested in efficiency than in the distribution of policy burdens. Flexible approaches did not necessarily provide the lowest political costs to policy makers, nor were they supported by many environmentalists (U.S. Congress, Senate 1993, 1382–1385). Both Congress and the EPA wanted to strengthen implementation, and the public was unhappy about previous results, so the CAA remedied this to a certain extent by giving some flexibility to the sources and new implementation methods to the administrators. While in the 1960s and 1970s, the public health concerns were prevailing, in the 1990s, an emphasis was given to the strategies of implementation.

REGULATORY INNOVATION

As has been demonstrated, a complexity of the implementation process moves the context of political choice from the legislature to an administrative agency. While the CAA of 1990 established many specific provisions, even more requirements remained subject to interpretation, leading to controversies over implementation and resulting litigation. Many provisions of the 1990 Act were consciously left for the EPA to implement under previous authority. Marketable permits became one of the most important instruments in policy implementation, but not the only flexible instrument. The agency developed several other innovative approaches to reduce air pollution. These new flexible instruments not only facilitated compliance for polluting sources, but were also directed at improvement of implementation by the agency itself.

Emissions Trading Programs

Title IV of the CCA addressed acid rain problem and presented an implementation challenge (Ellerman et al. 2000; Henriques 2004). Any marketable permit approach requires creating a new institutional practice, namely, property rights that are traded, along with a system of rules for trading them. Such markets take a considerable legal and political investment to establish, and a continuing investment to monitor. In addition, the market will not work unless sources can measure the exact quantity of their discharges. Only such precise measurement can tell them the extent to which their rights exceed their emissions, thus allowing them to sell rights to others.

A program created by the EPA set a predetermined cap on overall emissions of SO_2 while permitting a trade of the allowances among pollution sources to meet the standards for SO_2 in a flexible and cost-effective manner.

Allowances represented quasi-property rights for emissions to prevent a challenge of an unconstitutional "taking" should the government decide to alter emissions caps. Functionally, however, ownership rights and responsibilities of allowances were similar to property rights (Ellerman 1999).

In order to make the clean air market program work, Allowance Tracking System (ATS), Emissions Tracking System (ETS), and the Continuous Emissions Monitoring System (CEMS) were established (Ellerman et al. 2000). These systems facilitate compliance information processing and allow citizen access to the information. They provide a framework for categorizing transactions and produce a feedback report to industries about the levels of compliance. The EPA verifies compliance annually and assesses penalties in cases of noncompliance (U.S. EPA 2003).

In 1993, the EPA promulgated its final rules for the Acid Rain Program (58 FR 3590, 1993). By 1994, SO_2 emissions trading market had taken shape. Most of the trading occurred directly between sources (Ellerman et al. 2000). However, to estimate the price of the allowances, the Chicago Board of Trade began administering the EPA's allowance auction (Henriques 2004). In 1999, the EPA Acid Rain Division was transformed into the Clean Air Markets Division, which reflected the extent to which flexible economic instruments began to be established and supported (U.S. EPA 2002b).

Marketable permits were also established for NO_X emissions in 1998 as a part of State Implementation Plans and in 2000 as a Federal Program, when the agency issued final rules to control emissions of NO_X as precursors of ground level ozone problem or smog (U.S. EPA 2003c). In the rules, the EPA made final its findings that stationary sources of NO_X emissions in twelve upwind states and the District of Columbia contribute significantly to ozone levels in northeastern states. Although the EPA's approach has generally been upheld to date, the courts still carefully examine EPA legal reasoning and decisions (Appalachian Power v. EPA 2001). Notwithstanding its shortcomings, the EPA's approach in the NO_X rule had the strength of a regulatory tool that took costs into account and provided a road map for the states (Garret 2004).

The environmental credibility in implementing flexible mechanisms cannot be overestimated. New instruments for environmental policies have to assure that environmental goals are met. Another major aspect of establishing and maintaining flexible instruments is the ease of implementation, or, alternatively, the burden that the government has to carry. To address both factors, the Acid Rain Program redesigned its approach to permitting and monitoring compliance. Instead of detailed permits with technology specification, sources were required to continually monitor emissions and report the results to the EPA (40 CFR §75.1–75.75). This aimed at reducing transactions costs and encouraging a development of markets for emissions.

While environmentalists still feared a potential creation of hot spots from trading programs, no such local impacts have been observed and overall air quality has improved (Swift 2000; U.S. EPA 2003a). There are several reasons why trading provisions did not result in hot spots. Primarily it was because other regulations, such as ambient air quality standards and technology and performance requirements, protected local air quality from excess pollution. Permit trading represented an additional level of pollution control (Schreifels 2000; U.S. EPA 2003a). Facilities must comply with health-based standards and technology prescriptions, which are independent of the trading program and cannot be circumvented through purchases of allowances.

Second, penalties serve as reinforcement for the program. Automatic penalties for not holding enough allowances were established. These penalties were set at $2,000 per ton. Allowances for the following year are confiscated for every ton emitted over allowance levels. The CAA has additional administrative, civil, and criminal penalties of up to $25,000 a day per violation (U.S. EPA 2003a). Emissions trading mechanisms were mapped onto the existing regulatory mechanism of enforcement, which was directed at meeting environmental goals.

Variety of Flexible Approaches

Marketable permits are not the only flexible instruments used to achieve flexible environmental protection. While the CAA of 1990 was dominated by policies to stimulate technological development to control air pollution, overly prescriptive "technology forcing" schemes and inability of direct regulation to deal with the complexity of environmental issues opened some possibilities for innovative approaches. A response to the challenges of an increasingly complex and rigid regulatory scheme is best exemplified by the EPA's Project XL, or "Excellence in Leadership" Initiative, incentives for self-policing and audit, and the National Environmental Performance Track Program. These provide more flexibility to the regulated, but also allow for an easier steering of policies by the agency.

Project XL

Project XL, a national pilot program, allowed businesses, state and local governments, and federal facilities to develop innovative methods to test better, more cost-effective ways of achieving environmental protection. It was an effort to stimulate regulatory flexibility through site-specific, performance-based environmental standards developed through stakeholder negotiation. In return, the XL program participants received regulatory, program, policy,

or procedural flexibilities to conduct innovative projects (Lund 2000; U.S. EPA 2002c).

The selected proposals possessed certain common features including beyond compliance performance based on emissions trading, facility emission caps, multimedia permitting, and elimination of obsolete requirements. However, the most important feature of the project was that the EPA evaluated proposals against a baseline to determine whether the specified performance target was superior. The XL proposals sought to define environmental baselines in terms of general environmental indicators, including pollutant emissions and ambient concentrations. The project did not prevent facilities from enforcement, but advance notice was provided to facilities with XL projects in development before a civil or administrative action was brought against them (U.S. EPA 2001a, 2007). This fact had great implications for enforcement strategies. While the EPA did not target facilities for enforcement as a result of their participation in Project XL, neither did their participation fully immunize them from enforcement. Project XL participants were granted a time-limited opportunity to disclose and correct such violations, which ensured achievement of operational flexibility with environmental accountability.

Project XL was important to the agency itself. According to Lisa Lund, "one of XL's major contributions [is] providing the EPA the ability to make Agency-wide decisions that are both consultative and timely and that allow the Agency to speak with one voice" (Lund 2000 at 10125). Because Project XL encouraged public participation and input into decisions between the EPA, the states, and industry, it promoted more collaborative relationships. The agency could serve as a mediator between constituencies while they build understanding and confidence. The EPA opened a possibility through which the regulated community and others bring innovations to the agency's attention. Project XL was a way of introducing a flexibility-with-safeguards approach to the EPA and the states in a manner that helped promote systematic change. Finally, Project XL was crucial in building capacity for cross-agency and cross-media experimentation (Lund 2000).

Establishing Project XL, however, represented many difficulties. As a legal subject, Project XL was vulnerable because of its dual commitment to fostering site-specific innovation and developing models for systematic regulatory change and regulatory reinvention (Steinzor 1996). If combined with weak public participation and approval, and an absence of standards for evaluating the substance of proposals, a possibility that the precedents set in individual proposals could be applied industry-wide may raise doubts among regulators, industries, and environmental proponents. The viability of the project could have been undermined if the EPA did not provide

for a determined program structure or policy and stakeholder involvement in the program design (Lund 2000). According to the EPA, twenty-five innovations resulted from the XL projects, including enhanced public access to information, testing incentives in exchange for early compliance, developing compliance screening for voluntary project sponsors, and many others. While the EPA is not accepting any new applications for XL since January 2003, several spin-off projects emerged together with an agreement between the agency and the states to guide environmental regulatory innovations in the future.

A key step for the XL and similar projects would be the passage of legislation that would facilitate its use. While the EPA is running projects using its current authority, such as site-specific rule-making, any alternative compliance plan would benefit from congressional authorization. From a legal perspective, such legislation would ensure that the participants in the program could have some assurance that their projects are protected from legal challenges (Mohin 1997; Lund 2000). From a regulatory perspective, it would clarify delegation of authority to the agency.

Self-Policing, Audit, and Environmental Performance

Introduction of flexible instruments may not only be pursued for general strategies of regulation, but also for more specific spheres such as enforcement. While early enforcement programs achieved positive results, they increasingly consumed economic and human resources of already overburdened agencies (Grayson and Riewer 1997). Innovative enforcement programs now complement such measures as notices of violations, administrative proceedings, and settlements. Self-policing, disclosure, and other strategies provide some ease in enforcement, and give industries time to comply without being challenged in court. The use of compliance incentives, which was initially introduced in the mid-1980s, and which finally took the shape of Policy on Incentives for Self-Policing: Discovery, Disclosure, Correction, and Prevention of Violations, demonstrates a major step toward flexibility (60 FR 66706, 66710, 1995). Self-policing is not the only tool to ensure compliance and high environmental performance. The agency developed and now employs a variety of innovative instruments: Environmental Management Systems (EMSs), partnerships with states to establish self-certification Environment Results Programs, Audit Programs, collaboration with the Security and Exchange Commission (SEC) to use market-based mechanisms to promote environmental compliance, and incentives of the National Performance Track Program.

The EPA's audit policy provides incentives for companies to utilize environmental audit and compliance management systems to detect, dis-

close, and correct violations. It reflects a combination of two government interests: encouraging comprehensive, systematic audits and ensuring that environmental violations are properly disclosed and corrected. The agency endeavors to ensure that companies that perform self-policing necessary to improve their compliance will not be subject to gravity-based penalties (punitive portion of a penalty) when they report their violations and they will not recommend a company for criminal prosecution if the company meets discovery and disclosure conditions (U.S. EPA 2004c). For instance, facilities participating in the Clean Air Act compliance incentive program include those with above-ground tanks that store substantial quantities of volatile organic liquids, including petroleum products—refineries, chemical plants, and other facilities. Under an incentive program, facilities agreed to install enhanced emission control devices on their above-ground storage tanks. In return for facilities' participation, the EPA agreed to eliminate any penalties from those plants that audit, disclose, and correct leaks from emission control devices (U.S. EPA 2001b).

Facilities can receive greater flexibility in compliance not only through self-disclosure, but also through the establishment of the Environmental Management Systems (EMS) in enforcement settlements as injunctive relief and Supplemental Environmental Projects (SEP) (U.S. EPA 2003d). The EPA-sponsored EMS research started in 1995 to identify the benefits for environmental and business management projects, as well as promote compliance. The EPA's Office of Enforcement and Compliance Assurance continues to encourage compliance-focused EMSs as an injunctive relief in enforcement matters when it is necessary to address the root causes of violations. While the EPA's policy is to seek appropriate relief to achieve compliance, its major goal is to minimize a potential for repeat violations and improve environmental performance (U.S. EPA 2003d).

The Agency also assists states, tribes, municipalities, citizens, and the regulated community to develop EMSs, plain language regulations, and compliance assistance tools. In many cases, this leads not only to the mitigation of enforcement aspects, but also to the establishment of exemplary environmental performance through the National Environmental Performance Track Program. The program was established by the agency in June 2000 to recognize and reward companies and public entities that consistently exceed regulatory requirements, work closely with their community, and stand out in protecting the environment and public health. To join the program, a facility has to demonstrate that it has a record of regulatory compliance, a commitment to continuous improvement, a mechanism for public outreach, and an EMS. By the end of 2006 there were more than four hundred members in the Program in forty-six states and Puerto Rico (U.S. EPA 2007b). In air quality regulations, the agency gives preference to

Performance Track members in developing flexible permits that will reduce permitting costs and uncertainty, and provide for alternative compliance methods faster than for the rest of the regulated community. For example, the CAA and the National Emissions Standards for Hazardous Air Pollutants (NESHAPS) require sources of air pollutants to use Maximum Achievable Control Technology (MACT) (U.S. CAA 1990). In 2003, the EPA proposed a rule that provides Performance Track members with pollution prevention compliance alternatives for sources subject to MACT standards. Should such sources eliminate hazardous emissions from all emission points subject to a particular MACT, the rule will apply to exempt such sources from MACT and permit requirements under Title V of the CAA (68 FR 26249, 2003; U.S. EPA 2003b).

These compliance incentive tools may be applied together, but they are definitely only supplements and not substitutes for the direct provisions of law and regulations. Although the audit policy prohibits routine requests for audit reports, the EPA has refused to grant audit reports a privileged status that would protect them from disclosure or an immunity status that would protect facilities from penalties for environmental violations (65 FR 19618 April 11, 2000). In case of the National Performance Track Program, a facility can only have the benefits of the program if it complies with all regulations. If there are violations and they are not self-discovered or self-disclosed by facility itself, facilities already in the program will be subject to penalties under direct regulations (U.S. EPA 2003b). The EPA holds a position that strong governmental programs to enforce environmental laws and regulations are essential to ensure protection of public health and the environment. Voluntary compliance programs and initiatives developed by the agency can supplement strong and effective enforcement of environmental laws and regulations, encourage shared trust between regulated entities and government, and facilitate the attainment of environmental protection goals.

Making Flexible Instruments Permanent

The most recent proposal to deal with air pollution using flexible instruments is the Clear Skies Initiative proposed by President George W. Bush. The first initiative appeared in February 2002, and then was reintroduced again in January 2003 during the president's State of the Union address. According to the EPA's analysis and modeling, the Clear Skies program may deliver health and environmental benefits through a market-based approach that rewards innovation, reduces costs, and ensures results. Clear Skies could reduce and cap emissions of sulfur dioxide (SO_2), nitrogen oxides (NO_X), and mercury from electric power generation to approximately seventy percent

below 2000 levels (U.S. EPA 2003e). Mandatory emission reductions using Clear Skies' market-based cap and trade programs could continue a tradition started with the Clean Air Act programs to facilitate achievement of environmental goals and economic growth. The Clear Skies Initiative could go even further by establishing integrated multipollutant emissions reduction strategy for power generation.

Yet there are great uncertainties about regulatory development, litigation, and implementation time as to how effectively and efficiently current regulations would be implemented. Can Clear Skies Act's incentive program guarantee that emission reductions are maintained over time? While the initiative is based on the protections provided by the health-based national air quality standards, emission reductions would not be voluntary and technology-based new source standards on all new power generation projects would still be required. In addition, shorter timetables and lower emissions caps in alternative proposals may replace the original initiative. The debate over the Clear Skies goes on and the likely result would be the continued "muddling through" approach to environmental legislation, with key decisions made by the agency and in courts, where the agency would struggle to achieve better environmental results coupled with compliance flexibility.

CONCLUSIONS: INCENTIVES, FLEXIBILITY, AND REGULATORY CHANGE

More than three decades after the first comprehensive Clean Air Act was passed by Congress, the United States achieved significant results in air quality improvement. Pollutant emissions were down by almost twenty-nine percent, while the country still experienced economic and population growth. Whereas most of the progress has been attributed to direct regulation, the importance of flexible instruments cannot be underestimated.

The development of air quality policy in the United States illustrates how institutional factors shape the context and the process of flexible instruments adoption. A major structural achievement in the beginning of the environmental era was the creation of a national environmental agency. While multiple states had an opportunity to experiment with flexible controls, especially through the design of State Implementation Plans, it was the EPA that introduced and developed trading schemes and other flexible tools, and fought in courts to preserve their application. The EPA served as an agency providing states with guidance and technical and regulatory assistance in establishing flexible approaches. Later some states developed and introduced diverse and innovative air quality provisions, such as pollution trading and emission fees.

A wide array of policy tools from "bubble" policy to marketable permits found its start in the Office of Policy, Economics, and Innovation. Congress and courts established the outer limits of possibility, but the decisions that made a difference to those concerned with the outcome were made by the agency. The main strategy of providing flexibility was a balance between maintaining strong protection throughout the country and accommodating diverse and rapidly changing needs, capacities, and priorities within society. EPA innovation and reinvention strategies are usually designed within the existing agency programs and regulations, and are aimed at streamlining regulation, improving compliance, and achieving environmental results. Direct regulatory programs are still the core of the U.S. environmental system, but they are constantly augmented by innovation and new instruments to meet current and future demands.

Introduction and implementation of incentive-based instruments are supported by an already existing system of noncompliance penalties, fines, as well as civil and criminal liability. Provisions for penalties in trading schemes and multiple other flexible approaches are authorized by law as well as cemented in EPA regulations. The EPA aims at increased cost-effectiveness of the programs, voluntary attitudes that build mutual understanding and trust, but also at reduction of implementation burdens by agencies. To ensure effective implementation of air protection programs, a variety of flexible instruments were initiated. While the EPA is well known for its use of emissions trading as a key feature of introducing flexibility into air quality control, information disclosure incentives and voluntary programs have also become an important environmental management tool at the EPA over the past decade.

The U.S. air quality policy also directs our attention to more general matters with regard to regulatory discretion and capture, models of governmental action, and issues of good governance, which will be also revisited in the concluding chapter. First, a transition to the use of flexible instruments signifies a switch from working with traditional direct regulation, which is usually considered as simply a question of governmental policies imposed on regulated communities. Improving on the intervention strategies by the state to correct market failures indicates that policies are moving in a new direction. New modes of governmental action may still represent an authoritative setting of policy making and implementation, but one that is complemented with a considerable transfer of power to societal actors. Stimulating regulatory flexibility through the provision of incentives to economic agents, societal groups, and individuals, and developing of a variety of policy delivery mechanisms enhance stakeholder participation and negotiation. Governmental institutions may be considered mediators to promote collaborative relationships between constituencies to increase policy accountability, understanding, and confidence. By opening a possibility to

the regulated interests and citizenry at large to be more active participants in policy, the government also increases the prospects that nongovernmental actors will bring innovative approaches to the government's attention. Such policy power-sharing would lead to a systematic change and improvement in policy performance through fostering communication, innovation, and regulatory reinvention.

Second, the introduction of flexible approaches engages and encourages governmental agencies to vary their practices, rather than implement a "one size fits all" approach. The EPA's efforts to introduce flexible strategies resulted in the emergence of radical new policies. Without a doubt, this process was not smooth, as industry and environmental groups used lawsuits to pursue their goals, and some states complained about additional burdens. However, it is doubtful that these same groups would not be suing if the EPA was only command-and-control oriented. Regulatory reinvention depends on discretionary innovative activities of governmental agencies that bring more credibility to policy application. This allows not only for the flexibility in pollution abatement but also serves as a precursor of statutory change. A well-designed implementation process could increase considerably the legitimacy of proposed rules and regulations and reduce the chance of policy stalemate or challenges in courts.

In considering how to achieve policy effectiveness, coherence, and coordination, it is necessary to account for the differences in the views of a strong governmental authority. Top-down regulation is usually viewed as rigid, ineffective, and costly. Top-down regulation can also result in governmental failure to account for a growing complexity of policy matters or adjust to rapid changes in the age of innovation. Due to these concerns, decentralization, devolution, and self-regulation trends seem to be more effective, efficient, and lead to better policy performance in general. However, policy fragmentation may result in a lack of policy coherence and coordination, especially in applying innovative strategies. Decentralization or self-regulation without the safeguards of consistent rule-making, without attention paid to past practices and experiences, and without public accountability threatens to evolve into a system in which government makes vague demands with no clear guidance. As a result, it is possible to lose the advantages of more flexible approaches that occur through the incentive schemes and power-sharing in policy implementation, but also it is possible to lose the benefits of certainty and accountability that usually come with more formal and centralized policy processes. Hence, it is fundamental to realize that a new model of governmental action should build on the previous successful practices of policy making and implementation. At the same time, a new model of governmental action should be developed around encouraging and creating effective policy networks by increasing the number of legitimate policy participants and enhancing the means to achieve collective aspirations.

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CHAPTER 4

How Technology Forcing Limits Flexibility

U.S. Water Quality Policy

Water quality policy in the United States laid out ambitious national goals. A major form of statutory control was a strict prohibition of certain conduct based on an understanding that there was no right to pollute. This regulatory approach lasted for more than thirty years, and the Clean Water Act was often referred to as the most successful U.S. environmental legislation (Water Environment Federation 1997). While such policy resulted in significant improvement of water quality in the country, the costs of regulation and compliance, and the time and efforts that public and private entities devoted to its implementation, suggested the need for alternative approaches to water policy.

Several flexible strategies, such as variances and trading, emerged in water quality policy and regulations, as the perception of problems and experience changed. However, as will be demonstrated, clean water policy in the United States lagged behind clean air policy in the timing and scope of the introduction of flexible instruments. What explains this delay in the introduction of flexible tools? What are the factors that initiate policy changes and impact the process of flexible tools introduction? Water quality policy is in many respects similar to air quality policy because we are dealing with common pool resources. However, water resources by themselves are more excluded than air resources. This may mean that not all policy tools are applicable to water quality policy. A difference in forms of discharge and the initial attempts to regulate water pollution explain the difference in the development of alternative approaches in water quality policy.

In the United States, the Federal Water Pollution Control Act (FWPCA) of 1972 marked a major shift of policy from the states to the

federal government. Under the law, the Environmental Protection Agency set technology-based national effluent limitations for polluting sources, wrote permits for dischargers, and coordinated, approved, guided, and enforced water quality programs throughout the country. Concentration of regulatory authority was necessary to provide effectiveness, performance, and goal achievement.

Technology-based standards, statutorily prescribed in water policy, were much more rigid and inflexible than performance-based standards used in air quality policy. These stringent prescriptions on *how* to achieve certain water quality encumbered the development of flexible strategies. Initial changes in policy tools were marginal and occasional. It was a relaxation of policy provisions in the form of variances, extended deadlines, and modifications to permits, rather than the adoption of flexible instruments. The EPA federal leadership and stronger incentives to state and local agencies proved necessary to implement existing provisions and address future challenges. Effluent trading is now developed and implemented in many watersheds throughout the country. It is an instrument that did not represent a radical departure from the existing system of permits as well as a "safety net" of minimum technological controls remained to assure the achievement of water policy goals.

Regulatory initiatives also resulted in the development of voluntary approaches, informational tools, and auditing schemes in water quality policy during the late 1990s and early 2000s. Nevertheless, clear legal authority is necessary for flexible tools to be developed and implemented. Explicit statutory provisions would greatly facilitate flexible mechanisms in terms of offering assurance to the regulated sources and the agency itself. Table 4.1 summarizes the development of water quality regulatory approaches in the United States.

This chapter moves through four stages explaining the evolution of water laws and regulations. An historical perspective on water pollution control is followed by the analysis of technology forcing in the clean water law of 1972 and the resulting regulations to demonstrate the seriousness of the federal response to water pollution problems. An examination of policy provisions of the 1977 amendments and regulatory initiatives with water policy instruments uncovers the institutional determinants for flexibility. Finally, the regulatory framework, changed after the 1987 amendments, demonstrates an inclination of water quality regulations toward effluent trading and voluntary approaches. The conclusion to this chapter demonstrates a significant influence of the extant legal and regulatory framework on the introduction of flexible tools, as well as assesses the overall character and likelihood of policy changes.

Table 4.1 Evolution of EPA's Regulatory Approaches in Water Quality Policy

Year	*Regulatory Activity*
1973	EPA establishes National Pollution Discharge Elimination System
1974	EPA issues a statement on the discretionary character of enforcement
	EPA establishes a variance procedure for BPT in cases when "fundamentally different factors" exist in an industry
1975	EPA publishes first water quality regulations
1976	NRDC challenges a variance procedure
1977	The Supreme Court authorizes the EPA to promulgate regulations establishing uniform, single-number, industry-wide effluent limitations for existing dischargers
	The Supreme Court affirms that EPA's practice in granting variances is not only acceptable, but necessary
1978	EPA considers a "bubble" approach to the NPDES system
1979	EPA promulgates a BCT methodology
1982	EPA promulgates regulations providing for "water bubbles" for Iron and Steel Industrial Category
1983	Settlement between the EPA, Iron and Steel Industry, and NRDC approving of the "bubble" approach
	EPA promulgates Water Quality Standards regulations
1992	EPA Administrator's Point/Non-Point Source Trading Initiative
1995	EPA establishes Project XL to test better and more cost-effective ways of protecting the environment and public health
	EPA issues Policy on Incentives for Self-Policing: Discovery, Disclosure, Correction, and Prevention of Violations, also know as Audit Policy
1996	EPA issues a policy statement on effluent trading
	EPA issues a Draft Framework for Watershed Based Trading
2000	EPA establishes National Environmental Performance Track Program
2002	EPA proposes trading policy in watersheds
2003	EPA issues a policy ruling on watershed based permitting
	EPA promulgates policies on Water Quality Trading

A GROWING NEED FOR WATER QUALITY CONTROL

The Federal Water Pollution Control Act (FWPCA) of 1948 represented an increased federal interest in water quality in comparison to the first federal water quality law, the Rivers and Harbors Act of 1899, which prohibited discarding any refuse impeding navigation. The FWPCA provided state and local governments with technical assistance and funds to address water pollution problems. The act authorized the federal government to engage in research, investigation, and surveys. However, similar to the early air quality legislation, water pollution was viewed as primarily state and local responsibility. That meant there were no federally required standards, goals, limits, or targets. In the words of Representative Blatnik, the act "was a modest permissive beginning that scarcely scratched the surface of the problem" (U.S. Congress, Senate 1973, 351). Federal involvement in enforcement was strictly limited to cases involving interstate waters and only with the consent of the state in which such pollution originated (Kneese and Schultze 1975; Patrick et al. 1992; Freeman 2000).

During mid-1950s and into the 1960s, water quality legislation was influenced by several laws, which amended the 1948 statute. Table 4.2 demonstrates the development of water pollution control laws in the United States.

The Water Pollution Control Act of 1956 established a federal program of grants to municipalities to share the costs of water pollution control. The same legislation also established enforcement conferences to deal with individual dischargers. When a serious violation occurred, the Public Health Service convened an enforcement conference with local officials, major polluting sources, and other interested parties to decide about cleanup measures. Such dependence on goodwill and voluntarism did not show the signs of effective pollution control. The federal role and jurisdiction gradually extended to include navigable intrastate and interstate waters. In addition, water quality responsibility shifted in 1965 from the Surgeon General to the Federal Water Pollution Control Administration within the Department of Health, Education and Welfare (HEW). When the emphasis of water policy changed from health to resource conservation concerns, water policy moved to the Department of Interior (Kneese and Schultze 1975; Lieber 1975; Patrick et al. 1992).

Congress mandated state water pollution control policy and set interstate standards to determine actual pollution levels with the Water Quality Act of 1965. Based on these standards, states determined allowable discharges authorized in permits. The first national effort to put into practice a permit program occurred from 1969 to 1971, when the U.S. Army Corps of Engineers issued discharge permits under the Refuse Act of 1899.

Table 4.2 Development of Water Pollution Control Legislation in the United States

	Water Pollution Control Act (1948) and Water Pollution Control Act Amendments (1965)	*Water Quality Act (1965)*	*Federal Water Pollution Control Act (1972)*	*Clean Water Act (1977)*	*Water Quality Act (1987)*
Federal Power/ Authority	Weak	Strengthening	Strong	Mixed	Mixed
Federal Role	Research Funding Enforcement conferences	Research Funding Federal oversight	Federal standards Research Funding	Federal/State standards Research Funding	Federal/State standards Research Funding
Degree of Federal Involvement	Narrow	Widening	Wide	Wide	Wide
Policy Provisions	Water pollution State water quality criteria Federal grants	Water pollution Interstate ambient water quality standards Federal grants	Water pollution Fishable and swimmable waters Federal effluent standards NPDES: permits Increased federal grants	Water pollution NPDES: permits Toxic pollutants Federal grants	Water pollution NPDES: permits Toxic pollution Variances Administrative penalties Non-point sources State Revolving Funds
Regulatory Instruments	State Standards	State Implementation Plans	Direct regulation Technology	Direct regulation Technology	Direct regulation Technology

However, such a comprehensive permit approach required congressional authorization. In addition, enforcement still remained the responsibility of the states (Freeman 2000). The overall pattern was federal-state cooperative activities, especially with regard to shared standard-setting procedures and funded water quality projects.

Disenchantment with the Policy

While many in government and academia constantly supported a strong state role in water pollution control, the existing strategy was not effective. For many years, the absence of progress was blamed on the lack of funds, changes in legislation, and insufficient personnel. The strategy that was pursued, however, suffered from more fundamental problems (Kneese and Schultze 1975). First, by the 1960s, there was a widespread perception that existing enforcement procedures were too time-consuming and that the water quality standards approach was unsound because of the difficulties in determining pollution reductions. In theory, a model could have been developed to link water quality in a particular basin to discharges. In practice, this model would have gone beyond the capabilities of the states, which made the states apply secondary treatment requirements to dischargers (Tietenberg 2000). In addition, an intricate problem of linking subsidies to enforcement was not solved. Subsidies were aimed at a construction of treatment facilities rather than encouraging more effective use of common-property resources (Kneese and Schultze 1975). To make things worse, there was a difficulty in identifying a legally satisfactory way to connect violations to polluters. States differed in their commitment, resources, means of implementation, and predisposition to locating industries within their borders to improve economy. Additionally, there was a growing disappointment over a slow pace of pollution cleanup efforts and a suspicion that existing water pollution control technologies were not employed (Freeman 2000). These problems and frustrations, along with increased public concern about environmental degradation, initiated a congressional response with the 1972 amendments to water quality law.

CENTRALIZING WATER POLLUTION CONTROL

Passage of the Federal Water Pollution Control Act Amendments of 1972 marked a radical change in approach and philosophy toward water pollution control. The act starts with a broad declaration: "The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters," including goals directed toward protection of fish and

wildlife, prohibition of discharge of toxic pollutants "in toxic amounts," and elimination of polluted discharge by 1985 (U.S. FWPCA 1972).

After two years of work and congressional override of a presidential veto, the FWPCA stood as the most ambitious and expensive statute. The act established new federal goals and guidelines, and provided broad authority to the Environmental Protection Agency. The EPA had to establish the National Pollutant Discharge Elimination System (NPDES) program and the National Pretreatment Program; define pollution control technologies and establish effluent limitations; obtain information through reports and compliance inspections; and take enforcement actions, both civil and criminal, when violations of the act occurred. The delegation of such broad authority to the EPA signified the confidence that Congress placed into this federal agency and "a commitment by this Government to clean up what it has allowed industry to get away with for decades (U.S. Congress, Senate 1973, 260).

The National Goal

The national goal was to attain fishable and swimmable waters by 1983, and eliminate all discharges into navigable waters by 1985. This provision of zero discharges meant different things to different policy makers. While the House Public Works Committee was less environmentally oriented, the Senate leadership wanted to actually achieve zero discharges. A major objection of representatives was that the Senate did not take into account the socioeconomic and cost factors that would be drastically affected. Eventually, a "no discharge" clause became a goal and not a policy, and as "such it serve[d] as a focal point for long-range planning . . . and development in water pollution control technology" (U.S. Congress, Senate 1973, 230).

Multiple hearings held by the Senate and House Public Works Committees provided a stimulus and information to push this new law.[1] Governmental testimony by the EPA Administrator William Ruckelshaus identified that the states' different approaches resulted in confusion and uncertainty toward water pollutions standards and permits. Thus, the federal government should take an initiative to streamline policy implementation and improve enforcement (U.S. Senate 1971). Many state representatives were mainly concerned with the amounts of money for sewage treatment, and were less than excited about increasing federal role in permitting and enforcement. To counterbalance such opinion, environmental groups pushed strongly in favor of a stronger legislation and federal initiatives. Their view could be summarized in the words of the Environmental Quality Chairman of the League of Women Voters: "We find the present program too small, too

slow, too weak and too disorganized" (U.S. Senate 1971, 640). Industrial representatives differed on their view of federal government involvement. For some, state standards were the best option because water quality differed in different states and national guidelines could cause economic dislocations. Others, however, insisted that federal guidelines would be more appropriate to provide consistency and reliability (U.S. Congress, Senate 1973).

The result was a conclusion that water quality planning was ineffective, enforcement was lax, and the technologies were either not put into practice or not developed well. To the Senate leadership, previous water quality standards had so entirely failed that they had no remaining role to play. In the words of Senator Cooper, water quality in the United States demonstrated "the need for strong, uniform, and enforceable standards . . . the need for a permit system . . . and the need for strengthened efforts in enforcement" (U.S. Congress, Senate 1973, 189). In addition, the lessons members of Congress learned from the experience with the Clean Air Act of 1970 influenced their approach to water pollution control substantively, philosophically, and in terms of operating style. The establishment of effluent limitations and abatement deadlines borrowed from the CAA. Similarly, the FWPCA passed despite industry opposition, which demonstrated that policy makers learned how to withstand such a protest. Technology forcing, little attention paid to the cost of compliance, and strict deadlines made the statute described as "tough." In the words of Representative Blatnik: "The time has passed when either Congress or the executive branch can afford to waste time, or shop for a bargain basement solution to water pollution control" (U.S. Congress, Senate 1973, 241).

Technology Standards

The means chosen to reach the act's objectives involved a system of technology-based effluent standards. Technology-based standards stipulate a technology or a technique that a source must use to control pollution. The statute required the same technological standards to be applied to *all* sources within a specific category, without a consideration of plant-by-plant discharges. Setting standards based on technological factors rather than water quality objectives was one of the major differences between clean air policy and clean water policy. An early lack of legislative success with water quality standards made Congress choose technology forcing that would "allow for swifter action in the fight against water pollution" (U.S. Congress, Senate 1973, 209). However, such standards would not require regulators to take the assimilative capacity of water bodies into account and assess a relationship between individual discharges and water quality. If required technology

would not be sufficient to meet state water quality goals, "further and more stringent controls must be imposed" (U.S. Congress, Senate 1973, 353).

National permits were a major departure in regulating pollution. First, it was a fundamental procedure for implementing water policy, which borrowed heavily from the Refuse Act of 1899. Second, it differed from air quality policy. While implementation of the Clean Air Act depended on the State Implementation Plans, clean water law required all dischargers to hold permits with technology-based standards. Permitting authority was placed in the EPA, where states could also be delegated permitting authority by the EPA under certain conditions. States, however, were to calculate Total Maximum Daily Loads and establish their own pollution levels as long as these levels were at least as stringent as those mandated by the EPA. Policy makers strongly believed that without any meaningful federal guidance fifty different permitting schemes would cause "an environmental nightmare" (U.S. Congress, House 1972, 401).

Were there any incentives provided by the act? Some would say that a federal contribution to support Publicly Owned Treatment Works (POTWs) was such an incentive. It was not an approach based on flexibility, but rather one that made implementation of the statutory requirements easier for the states and municipalities. Section 207 of the Act authorized $5 billion for fiscal year 1973, $6 billion for fiscal year 1974, and $7 billion for fiscal year 1975 for the states to reach established deadlines. The act, however, required that grantees institute use charge systems that would make each user pay its share of the costs of treatment (U.S. FWPCA 1972). Federal programs also continued to subsidize cities and towns for the treatment of municipal wastes. If, before 1972, states and localities were mostly responsible for the construction of sewage treatment works, the act increased the federal share up to seventy-five percent.

Direct industrial discharges had to achieve technology-based standards in two stages. The deadlines represented a strong desire by the Senate committee to approach problems of water pollution with definite goals and objectives. By 1977, industrial point sources had to meet the requirements of Best Practicable Technology (BPT). In establishing these national standards, the EPA was required to consider the total costs of these technologies and their relation to the benefits received, but not to consider the conditions of the individual discharger or a particular water body receiving effluents. By 1983, effluent limitations for industrial discharges should be based on Best Available Technology (BAT). However, Congress did not stop at these requirements. The EPA was mandated to establish effluent standards for toxic pollutants and could demand zero discharge of a pollutant if necessary. In general, industrial cleanup requirements were more restrictive than those of

POTWs. The reasoning behind that was that industry could raise money to abate, while municipal agencies could not.

In addition, as a true legislation based on direct regulation, the act provided for civil and criminal penalties for violations. Civil violations were divided into two major groups: regulatory law and civil action. Regulatory law was to be carried out directly by the EPA or a state agency, involving administrative orders, fines, and penalties. If a violation was either willful or negligent, it was a crime. Civil or tort action allowed citizens to sue industry and oversight agencies (U.S. FWPCA 1972). As well as with the Clean Air Act, industry asked for a relaxation of provisions and a more secure enforcement environment rather than an inherently different approach to water pollution control. For Congress, pollution control would be achieved by technological means and more efficient and economical treatments were supposed to be installed in polluters' self-interest. Pollution abatement was important, but water quality restoration was fundamental.

Expensive Regulation

The Act did not simply represent a direct regulation approach, it was also extremely expensive. Policy makers, however, explained the $18 billion price tag by the fact that it was impossible to "measure the wealth of our great natural resources in dollars alone" (U.S. Congress, Senate 1973, 99). According to early EPA estimates, removing eighty-five to ninety percent of pollutants from effluents would cost $61 billion. Removing one hundred percent of the pollutants would cost $317 billion (U.S. Congress, Senate 1973, 1127, 1141). While the White House objected to such costs, many in the administration realm were less concerned with authorization figures but rather with the feasibility of the act's provisions, especially the no-discharge clause. The EPA argued that meeting deadlines would be extremely hard because industry had to plan and buy abatement equipment. Moreover, in his letter to the Chairman of the House Committee on Public Works, William Ruckelshaus stated that the goals of the act, especially elimination of all discharges, would only be practicable if the costs of achieving them were justified by resulting social benefits (U.S. Congress, House 1972, 148).

Senator Proxmire and Representative Heinz proposed an effluent charge approach with a rationale of providing an incentive to industry to determine how best to abate its pollution. In addition, the effluent charge approach was seen as a mechanism that could facilitate implementation. An incentive provided by the charge system could be ongoing because it could operate even after standards were met. New technologies could compel industries to avoid charges and increase abatement. Finally, effluent charges could ease a burden on the federal budget, and provide a "fair and equitable method

[where] the one who pollutes should pay" (U.S. Congress, Senate 1973, 1319). This approach was not accepted because it called for an unwelcome additional tax, which would still require establishing criteria for charges, bases of assessment, strict enforcement, and additional bureaucracy with a possibility of confusion with respect to targets (U.S. Congress, Senate 1973, 614–616). A tax, as well as any other flexible instrument, would require setting up a connection between a particular pollutant and water quality. How then would one establish a price tag on toxics entering waters? Effluent charges were also rejected on the grounds that Congress could not "give anyone the option of polluting for a fee" (U.S. Congress, Senate 1973, 1322–1325). Policy makers were very busy deciding and arguing about the amount of authorizations under the act so that no other approaches to water pollution control, including permit trading, were sustained in the debate.

The most fundamental feature of the water quality law of 1972 was its assumption that the stricter the law, the more it could accomplish. Environmental groups, key policy makers, and the EPA officials regarded past measures as being inadequate and concluded that stronger measures were necessary. Congress recognized the need to undertake a forceful action. The EPA was also more than willing to assume another large project to firmly establish itself as a strong regulatory agency. Policy makers did not seek information on alternative strategies despite the advocacy by economists. Moreover, with some exceptions, the industrial lobby was not effective. The success of the program to a large degree depended on existing and anticipated technologies and studies of socioeconomic and environmental effects of achieving the goals.

COMMAND AND CONTROL IN PRACTICE

Notwithstanding the great detail in the 1972 Act, there was some room for elaboration on the statute's provisions through regulations. While the EPA generally followed statutorily prescribed strategies, the agency introduced limited flexibility in its regulations. In a context of rigid requirements, flexibility was introduced not only to ease compliance for the regulated, but also to help reduce the regulatory burden. However, technology forcing did not leave much space for experimentation with different instruments.

Keeping Direct Regulation

In an attempt to implement the FWPCA's provisions, the EPA issued its *Water Strategy Paper*, which contained the agency's intentions for water pollution control, strategies to set annual objectives, and allocate resources, and

regulatory reporting on the achievements. Most of the efforts were devoted to the National Pollutant Discharge Elimination System (NPDES) program, mandated by Section 402 of the Act. It regulated the discharge of pollutants from point sources and established necessary technological controls, secondary treatments, and other requirements. The NPDES permits were grounds for states to adopt and enforce anti-degradation policies to ensure that clean waters remain clean. To determine whether NPDES permit conditions were being met, Section 308 of the act authorized inspections and monitoring of regulated facilities.

A concept that all discharges into the nation's waters were unlawful unless specifically authorized by a permit was a distinguishing characteristic of the policy. In clean air law, this concept was introduced only in the late 1990s, yet water quality law made it a major feature of water protection in the United States. A chosen technological approach prescribed specific effluent limitations and, because polluted effluents were to be eliminated completely, a permit would show how the progress was made.

Bound by the statute to write permits for more that 60,000 municipal and industrial dischargers, the EPA turned to outside contractors and consultants for help in gathering data to set reasonable effluent limits (Tietenberg 2000). While the agency was to issue effluent limitation guidelines by 1973, this requirement proved unmanageable. By 1976, the EPA issued permits to only sixty-seven percent of all industrial discharges, but for more than ninety percent of major industrial sources (U.S. CEQ 1976). By the end of the 1980s, thirty-two states were also delegated permitting authority (Yeager 1991).

A considerable number of the EPA's administrative problems were not entirely its own fault. The agency had been submerged into a complicated and extremely demanding statute. All key decisions with regard to permits were also unusually open to public participation. Interested parties could file lawsuits, comment on regulations, and appeal decisions, both internally and externally. Final regulations were delayed, sometimes for years, as a logical consequence of such a structure of decision-making. However, at least from a perspective of industry, the EPA in the 1970s took an aggressive approach to regulation.[2] For all constraints on its activity, including budget and personnel shortages, the agency succeeded in implementing significant change in both water quality policy and industrial behavior. It has been estimated that, by 1977, about eighty percent of all industrial discharges were in compliance with the relevant technology standards. By 1981, the number of the sources in compliance grew to ninety-six percent (U.S. CEQ 1982).

It is important to note that industries, forced to comply with standards, preferred to adhere to the rules rather than innovate. Because effluent standards were based on specific technologies, these technologies were known to industries. Even though the industry could have chosen

any technology that kept effluents under limitations, industries tended to follow EPA recommendations to minimize the risk of lawsuits (Tietenberg 1984). Self-protectionist behavior of industry and availability of judicial review revealed that "environmental regulation . . . does not correspond with established theories of regulatory policy such as agency capture or interest group liberalism" (Lake 1982, 4). The law itself was extremely detailed, which to a large degree prevented the EPA from using boundless discretion not only within the framework of direct regulation, but also with regard to introducing new policy instruments.

This is not to say that industry did not participate in the process of implementation, or did not challenge the EPA's decisions. Industry actively challenged regulations in courts by emphasizing balancing considerations of technology-forcing standards. However, court responses varied with regard to the strictness of regulations and provision of variances to industries, mainly upholding the letter of the law. In some cases, the court ruled that environmental benefits could not be easily determined and prohibited careful balance of costs and benefits (see *American Petroleum Institute v. EPA* 1976). In other cases, appellate courts were willing to impose on the EPA a greater consideration of the costs and benefits of water pollution control (*Hooker Chemicals & Plastic Corp. v. Train* 1976). While the agency tried to keep a restrictive posture in issuing permits, it was still criticized by the environmental groups for administratively amending the law through too generous use of variances and exceptions.

Variance versus Flexibility

Granting variances and exceptions may ease compliance and provide some flexibility for industry and regulators in the short term. It may also serve as a basis of flexible and effective policies, and a move from direct uniform controls. An early famous study examining the cost-effectiveness of uniform standards in contrast to charges was conducted for the Delaware Estuary (Kneese 1977; Tietenberg 1984). The study demonstrated the desirability of more efficient and flexible approaches for water quality control. Despite this evidence, the regulatory reform that played a key role in air pollution regulation did not have the same impact in water quality regulations. The EPA granted limited variances to some industries, but did not move beyond that. Why didn't the EPA introduce some forms of offsetting or trading into water quality regulations, as it did in the early clean air policy?

One of the answers would be that the agency received an extremely detailed direction from Congress about instruments and deadlines. Another explanation would involve an issue of technology-forcing regulations written into permits in water quality policy versus harm-based regulations and

ambient air standards in air quality policy. A principal distinction between water quality standards under the Clean Water Act and implementation plans requirements under the Clean Air Act was that water quality standards were not directly enforceable. Water quality standards were to be established by individual states and implemented through the NPDES permits. Standards were pertinent only for writing effluent limitations into the permits. In addition, because regulations in water policy were based on engineering aspects rather than environmental and health considerations, exceptions were easier to make on technical considerations. Industry also felt more comfortable with a process in which its input into rule-making provided necessary information about technologies. Thus, the EPA was able to work with dischargers within the established framework of direct regulation.

The EPA introduced variances (39 FR 28926, 1974), extensions of deadlines, and exceptions in cases when a facility's circumstances were significantly different from the factors considered in the establishment of the regulatory guidelines. The courts upheld an application of variance despite the challenge from environmentalists (see *Natural Resources Defense Council v. EPA* 1976; *E. I. duPont de Nemours & Co. v. Train* 1977). In addition, technology-based regulations showed some advantages. While strict technology forcing inhibits innovation, technological standards still provided predictability, which could greatly increase industry capacity to plan, and on enforcement that was more manageable.

This is not to claim that implementation and enforcement of the law were smooth or exactly followed the rationality and uniformity anticipated by Congress. Industries took advantage of challenging many regulations and of resulting noncompliance while these cases were pending. Some unresolved administrative appeals prevented enforcement for months and even years. Many permits had been issued without benefits of final regulations written for the industrial categories (Freeman 2000; WEF 1997; Yeager 1991). Environmental groups were suing the agency for not regulating the toxics (O'Leary 1993). To the extent that such factors delayed and made implementation less effective, they could contribute to a potential of even stricter controls, especially with the increasing economic growth and toxicity of pollutants. Does it mean that water quality control would be devoid of flexible methods of regulation? The answer to this question would necessarily be based on the tasks the agency had to cope with, the type of statutory provisions, and the progress made under the direct regulation scheme.

As well as in clean air policy, the EPA was a central coordinating agency responsible for the implementation of the act's provisions. In air quality policy, the EPA was mostly responsible for writing standards for new and modified sources and approving state implementation plans for existing sources. Thus, by introducing "bubbles" and netting for modified sources,

the agency experimented with some flexibility early on to ease the burden on industry, and to ensure compliance without significantly deviating from the letter of the law. In clean water policy, the agency had to cover all possible dischargers with technological guidelines, effluent limitations, and permits, as prescribed in the statute. Introducing flexible controls would have imposed a much greater burden on the agency not only in terms of efforts to write additional provisions for regulations, but also in terms of an ability to defend their stance in courts. Moreover, as more facilities were installing Best Practicable Technologies (BPT), and compliance rates were growing, it was taken as a sign of a policy that was achieving results.

There is little doubt that technology forcing reduced discharges of conventional pollutants and improved water quality in many regions. The EPA's permit program forcefully implemented water pollution controls and achieved significant results in regulating industrial facilities. Technology forcing also promised water quality improvement and was indicative of a policy that worked.[3] The biggest concerns, however, and possible instances of involving flexible methods were non-point sources of pollution. At this stage in water quality policy, control of all non-point sources was the responsibility of the states, and the EPA excluded agricultural and silvicultural runoff from requirements of obtaining permits. Later on, the problems with these sources opened an avenue for introducing flexible instruments.

The implementation of the 1972 law was characterized by a complex interplay of bureaucratic policy, court interpretations, and the forms of industry compliance. It gave the EPA some discretion, which the agency proceeded to use in a direction that did not, however, involve explicit introduction of flexible instruments. The complexity of the law assured a presence of discretionary judgment, while the newness of the act demonstrated the role of power relations in the use of this judgment. In their focus on permits and technology specifications for point sources, the law and the regulations strengthened the logic of argumentation by industry that additional cleanup or no discharge provisions were not cost-effective or even fair from a societal point of view. The furthest that the EPA went with providing some sort of flexibility was variances for individual dischargers in good faith effort to tailor regulations, as well as to provide some flexibility in the process (Hall 1974). It was also a protection against judicial responses challenging regulations set incorrectly on the basis of faulty reports. In this respect, the variance provision reflected the statement of the court that "a regulatory system which allows flexibility . . . in a proper case, can lend strength to the system as a whole" (*Portland Cement Association v. Ruckelshaus* 1973). Flexible rules were not only a protection against pressure from both political and industrial interests in opposition to a uniform system, but they also helped strengthen the regulatory system itself.

MIDCOURSE POLICY CORRECTIONS

The Clean Water Act of 1977 is best defined as a midcourse correction to the approach outlined in the 1972 Act. Two major changes characterized this act. First, it postponed several initial deadlines for compliance with the effluent limitations by individual sources. Second, the act made a clear distinction between conventional pollutants, such as organic matter and suspended solids, nonconventional pollutants,[4] and toxic water pollutants. The criteria for conventional pollutants were now based on Best Conventional Technology (BCT) rather than stricter Best Available Technology (BAT) to prevent "treatment for treatment sake, and unnecessary expenditure of billions of dollars yielding no substantial improvements in water quality" (U.S. Congress, Senate 1978b, 329). New procedures and deadlines were established to determine effluent limitations for toxic pollutants, which was defined as a highlight of the legislation, and ensuring compliance.

The revisions, which represented more than two years of legislative effort, were generally well accepted by industry while remaining disappointing to certain environmental advocates (U.S. Congress, Senate 1978b). The act gave the EPA the authority to grant case-by-case extensions of the deadlines for the adoption of best practicable control technology to industrial dischargers who have made a "good faith" attempt to comply with the deadline. Non-point sources were exempt from permit requirements. In addition, the agency could extend the 1977 deadline for the installation of secondary sewage treatment facilities by municipalities for up to six years when a failure to comply was due to a lack of federal construction grant funds or to delays in a completion of ongoing treatment facility construction. Congress claimed that an original statutory requirement for the installation of Best Available Technology by all dischargers could, in some instances, prove environmentally or economically unjustifiable. As well as in clean air policy, Congress did not consider moving to alternative policy methods, but instead gave extensions to current requirements. Moreover, tighter controls imposed on toxic pollutants represented a significant escalation of the federal regulatory effort to prevent discharges of such substances into the nation's waters (ELR 1978; Patrick et al. 1992).

A major difference between the Clean Air Act of 1977 and the Clean Water Act of 1977 was that the latter did not adopt a noncompliance penalty. The Senate bill had included a requirement for an automatic imposition of a quarterly fee equivalent to economic savings from noncompliance on any point source exceeding effluent limitations or missing compliance dates specified in its discharge permit (U.S. Congress, Senate 1978b). However, already existing strict enforcement provisions for civil and criminal penalties prevented the adoption of a noncompliance penalty approach in water qual-

ity law, even though the noncompliance penalty was seen as an economic approach, almost as an incentive, in clean air policy.

The act included a new emphasis on controlling toxic pollutant discharges. In the words of Senator Wallop, "this legislation does not weaken the purpose of the law; it only provides . . . the pragmatic modifications that 5 years of experience have proven necessary" (U.S. Congress, Senate 1978b, 526). Congress believed that existing law and a manner in which it was administered were proven "more than adequate to the task to the point of calling into question the wisdom of proceeding to more stringent requirements" (U.S. Congress, Senate 1978b, 369). Even though policy makers did not provide the EPA with flexible methods of regulation, it was clear that Congress wanted to expand the agency's mandate and allow more discretion with regard to economic considerations of the act's implementation and to "the potential costs to individual companies, entire industries, and the economy at large" (U.S. Congress, Senate 1978b, 373). The merit of this bill for policy makers resided in the fact that the act had "a much better idea of what consequences would be for the environment and the economy" (U.S. Congress, Senate 1978b, 346). At the same time, being disappointed with the EPA's delays in writing effluent guidelines and procrastination with toxic pollutants and construction grants, Congress proclaimed that "the Agency simply must follow the intent of Congress" (U.S. Congress, Senate 1978b, 382). This placed the EPA into a position in which it had to carefully balance economic considerations and strict and detailed provisions of the law.

A MOVE TOWARD FLEXIBILITY

In promulgating its regulations, the EPA made significant progress in implementing the legislative intent and enforcing Best Practicable Technology limitations. Sources in most industrial categories complied with interim standards for pollution reduction. However, many difficulties appeared with establishing a new Best Conventional Technology program and meeting the deadlines. Delays in courts, inherent difficulties in regulating toxic chemicals, and a change in administrating a regulatory policy have significantly influenced the development of programs (Reed 1982). To cope with these difficulties, the agency attempted to introduce flexible strategies, especially "bubble" policy, for dischargers. In promulgating "bubble" policy, the agency took into consideration the ability of such a tool to meet required water quality goals and avoid placing extra burdens on the regulatory process. However, stiff technology requirements prevented the development of full-fledged flexible approaches, but resulted in a promulgation of less rigid performance-based standards, which would serve as a basis for future flexible strategies.

First Water "Bubbles"

The EPA came under increasing pressure to resolve what some industrial categories, the administration, and the public in general, saw as the excessive compliance costs and exceedingly intrusive feature of a number of environmental standards and requirements. Somewhat in response to those interests and to a large degree as a result of its own growing interest in the use of incentive-based instruments, the agency began to place more emphasis on flexibility in its water quality regulatory programs. The EPA claimed during congressional hearings that the Clean Water Act provided for "reasonableness," and that the agency would use discretion and even suggest "appropriate legislative amendments . . . should [the agency] find that the existing legislation does not provide suitable flexibility"[5] (U.S. Congress, Senate 1978b, 428). In 1979, the EPA started to consider whether to propose a "bubble" approach for dischargers covered by the National Pollutant Discharge Elimination System (NPDES) permit program (ELR 1979). This marked a step that represented its first application under the Clean Water Act. The legality of adopting the "bubble" approach in this context was in doubt, and there was still a disagreement over the exact conditions that had to be developed.

A key concern with the introduction of a "bubble" concept to water quality regulations was whether any form of such an approach was consistent with the provisions of the statute. The act required every point source to establish technology-based standards. The EPA's general counsel argued that it could treat entire plants, rather than individual pipes, as a source of discharge, thus not entirely contradicting the legislative intent but at the same time providing for a more flexible "bubble" approach. However, the agency also realized that it would be difficult to defend this stand in courts (43 FR 37090, 1978; ELR 1979).

Difficulties were to arise not only with a judicial interpretation, but also with convincing the staff of the EPA Water Enforcement Division of the legality of such an approach. Even though there was a split within the EPA, both sides agreed that requirements to install BPT, protect water quality, and comply with other regulations were indispensable in the case of "bubbles." The EPA's major concern was to prevent dangerous discharges of toxics and assure meeting environmental goals, as well as avoid placing too much of a burden on state regulatory agencies.

The first promulgation of "water bubbles" happened in 1982, when the EPA wrote regulations for the iron and steel industry (47 FR 23258, 1982). While about ninety percent of major industrial dischargers were in compliance, the steel industry was one of the notable exceptions to the general rule. Less than fifty percent of its facilities had been "brought to

required standards despite allocation of an estimated 75 percent of its capital spending for environmental improvement" (U.S. Congress, Senate 1978b, 496). Deadline extensions gave the industry some time. The EPA, however, went further to provide flexibility.

While initial 1982 "bubble" provisions were challenged by the NRDC and the industry itself, the 1983 settlement included important changes in the "bubble" policy (Miller 1983). As promulgated, the regulations gave the industry what it very much wanted. Flexibility made the prospect of compliance with significant effluent reduction requirements far more tolerable. This policy provided that any pollution trades within a source must result in a net reduction in pollution discharges of at least fifteen percent for ordinary pollutants and ten percent for toxic pollutants, which aimed at meeting environmental cleanup goals (U.S. EPA 2002d). Similarly, the agency viewed the "bubble" provision as an essential regulatory reform designed to improve the prospects of policy implementation.

Seeking Effluent Trades

EPA regulatory activity was also marked by an effort to provide a better connection between the NPDES requirements and water quality standards to effectively control pollutants, especially toxic ones. The culmination of this effort was Water Quality Standards regulations (54 FR 51400, 1983). From then on, the EPA's annual program guidance to the states reflected a bigger concern with toxics, and numeric and narrative criteria for water quality standards (U.S. EPA 1994). By developing water quality criteria, the agency accomplished two considerable tasks. First, it served as an initiator of the legislative agenda. In 1987, Congress recognized the need to strengthen water quality criteria and mandated the adoption of numeric standards for toxics. Second, the agency established less rigid performance-based standards, which served as a basis for future water quality trading schemes. The EPA moved toward establishing a water quality, rather than technology-based approach. State officials, on whose shoulders much of the responsibility for carrying out the programs of the Clean Water Act rested, welcomed such changes in the standards, which made them more flexible and responsive to water quality considerations (Reed 1982).

At least three states (Wisconsin, Colorado, and North Carolina) utilized a water quality approach and established programs for trading credits to reduce harmful effluents. The main reason was to create a program to provide flexibility for point sources such as paper mills and municipal wastewater treatment plants to meet state water quality standards (U.S. EPA 1992a; 2001). When a facility faced incremental control costs that were many times that of other sources, it provided a rationale for trading. These

programs were established to meet required water quality and provide for better prospects of future compliance with the law.

In contrast to technological requirements, where control devices must be in place to be in compliance with law, water quality-based standards, serving as performance standards, allowed for experimentation with policy tools. Economists generally agree that ambient quality standards are more cost-effective than traditional technology standards. It is important to understand these differences when exploring a possibility for the introduction of new instruments. State-led experiments with effluent trading also demonstrate that several states were pioneers in trading programs, rather than the EPA as a central coordinating agency. However, the agency influenced this process indirectly, by placing a greater emphasis on water quality standards with its 1983 regulations. While the EPA was not mandated by Congress to establish national water quality standards, the agency guided the states to do so. Nationally, a shift in regulatory focus first required a change from technology-based standards to ambient quality standards.

States had another economic tool at their disposal as provided by the act. When the EPA delegated responsibility for issuing National Pollution Discharge Elimination System (NPDES) permits to the majority of states, states could impose permit fees on discharges. Several states imposed charges for NPDES permits based on factors such as volume and toxicity of the effluent. For example, New York divided effluents into three categories and imposed a separate schedule of volume-based fees in each category. California used a fee scheme that was based on the type and volume of discharge. Many other states, however, imposed set fees for NPDES permits and did not differentiate by volume or toxicity (U.S. EPA 1992a; 2001). While fees could be a very strong incentive for polluters to reduce discharges, in many cases they served as "revenue raisers" to recover administrative costs of a permit program. All point sources were required to obtain permits in order to discharge; thus, set fees were unavoidable, as well as the installation of control technology.

In general, however, the framework for water quality regulation was left essentially unchanged with only several observable instances of flexible tools adoption. The EPA-organized studies demonstrated that "bubble" policy would not produce cost savings for most industrial facilities because most industrial facilities had a single point of discharge and already operated under permits that allowed all technologically feasible tradeoffs to be made. However, steel and iron industry compliance and cost savings were greatly improved with the use of "bubbles" (U.S. EPA 2002d). While the agency promoted the establishment of water quality standards in different states, a few states attempted to set up effluent trading. Overall flexible instruments were used much less in water quality policy, and with a slower rate than in air quality policy.

NEW DIRECTIONS IN WATER QUALITY POLICY

The 100th Congress passed the Water Quality Act of 1987, the last amendment to water quality law, over President Reagan's veto. Reagan's main opposition was to continued federal financial assistance to states and localities. However, Congress authorized another $8.4 billion through the year of 1994 for construction of sewage treatment facilities through the state revolving fund. Policy makers agreed that the Act was "financially feasible and technically sound" (U.S. Congress, Senate 1988, 352).

The Water Quality Act (WQA) contained many important improvements and provisions to streamline policy and improve water quality. With regard to the instruments, however, a basic scheme remained in place: "Every industrial point source in the United States will be operating under a permit requiring application of the best available technology" (U.S. Congress, Senate 1988, 315). While Congress recognized that many direct dischargers were unable to achieve compliance deadlines, there were no attempts to change the regulatory mechanisms and incorporate flexible tools, such as permit trading or effluent chargers. Instead, Congress set forth new compliance deadlines and reaffirmed EPA enforcement discretion to issue administrative orders for compliance beyond the new dates. Instead of flexible tools per se, policy makers stated that the agency and the states should consider issuing permits based on Best Professional Judgment (BPJ) limitations to achieve statutory deadlines.

The furthest that Congress went to provide for more flexible mechanisms was to affect the ability of dischargers to obtain modifications to their permits. The act had a new provision (§306) that codified the administrative program developed by the EPA. The authority to grant variances or modifications to dischargers based on "fundamentally different factors" was for the first time granted to the EPA by specific statutory language (U.S. WQA 1987). The act also required the Administrator to establish and collect fees from facilities applying for variances. These funds were to be deposited into a special Water Permits and Other Services Fund in the Treasury and were to be used to cover administrative costs of writing permits and granting variances (U.S. Congress, Senate 1988, 373). These permit fees are not to be confused with effluent chargers. Permit fees, as previous sections discussed, addressed administrative costs, rather than offer incentives to abate.

It is important to underscore that the act strengthened some of the command-and-control provisions. Congress increased enforcement provisions directing the EPA to impose administrative penalties and increasing penalty rates for civil and criminal violations (U.S. WQA 1987). In another major statutory clarification of the EPA regulatory program,[6] Congress enacted the antibacksliding provision (§404) of the act. This provision prohibited

the agency from reissuing an NPDES permit that contained less stringent effluent limitations.

Windows of Opportunity

A major shift in water quality policy came with recognition that certain waters could not meet water quality standards even with the imposition of best available technologies, renegotiated deadlines, and variances. The main contribution of the Water Quality Act to the possibility of the introduction of flexible instruments was that the act directly affected a water quality standards program. The basic reason for this was that toxic pollutants constituted one of the most pressing problems. States were required to identify water bodies that were not expected to meet water quality standards using minimum technology or levels of treatment and to develop programs for improving water quality (Patrick et al. 1992; Liebesman and Laws 1987). The act gave the EPA important rule-making responsibilities in assisting states in this area. The Administrator was to develop and publish guidance to be used by states in identifying waters subject to individual control strategies and information on methods for establishing and measuring water quality criteria for toxic pollutants.

Closely related to the requirement for individual toxic control strategies were strengthened requirements for non-point source pollution management. Congress specifically stated that the problem of non-point source pollution was a national problem because more than fifty percent of pollution came from non-point sources. Congress thus elevated the importance of non-point pollution to a national level, making it a greater responsibility of the EPA. Each state had to prepare management programs that included identification of "best management practices and measures" to control the non-point pollution (U.S. Congress, Senate 1988, 326, 350, 378). Congress provided for flexibility in approaches to control non-point sources: "this legislation allows the States great flexibility to design management programs containing regulatory or nonregulatory components" (U.S. Congress, Senate 1988, 387).

Congress did not directly provide for any incentive-based tools, but rather granted important new authority in an effort to improve the quality of the nation's waters in several noteworthy respects. First, policy makers realized the need to redefine federal-state relationships in water pollution control management, giving states more flexibility but still retaining considerable federal oversight. Second, Congress provided more definitive guidance to the regulated community and some avenues of relief from the act's strict guidelines. Even though the act "continue[d] strict national water pollution control standards" by emphasizing the move toward water quality criteria, and giving the EPA and the states more discretion, Congress opened

an avenue for experimentation with flexible instruments (U.S. Congress, Senate 1988, 347).

EXPANDING FLEXIBLE REGULATIONS

A shift in focus to issues of water quality, non-point pollution, and new standards were logical steps in the face of new challenges. The essence of these developments was regulating dischargers by their impact on receiving water quality. This new phase of water quality protection attempted to build on previous achievements and was conducive to the adoption of various new instruments.

Importance of Federal Guidance

Building on a concept of water quality standards, the EPA and the states began to devise methods to reach the goals and timetables for the coming years. Initially, the EPA struggled with the states to establish a floor for state water quality standards, to identify pollutants, and water segments that did not meet standards, and to set up Total Maximum Daily Load (TMDL) programs. EPA regulations placed their emphasis on basin or watershed planning to take account of all potential sources of water impairment. Many states, however, failed to submit their TMDLs and water quality plans, even though it was the states who so vehemently advocated water quality approach and states' control over water policy in general (Houck 1997; Copeland 2002). As a result, environmental groups sued the agency to take a stronger action on water quality regulations and force the states to comply with the law (see *Northwest Environmental Defense Center v. Thomas* 1987; *Alaska Center for the Environment v. Reilly* 1991; 1992).

Gradually the EPA established several initiatives of its own, the most proactive of which was new policy guidance for its regions and the states. The goal was to achieve agreements among the states, environmental groups, and potentially affected point and non-point sources over the implementation of this policy, and to prevent litigation. The EPA issued a draft *TMDL Program Implementation Strategy* by revising its 1991 regulations and setting up the "vision, priorities and steps" the agency would take to "help States" with the TMDL requirements and "promote innovative, low cost and equitable approaches to improving water quality" (U.S. EPA 1996a).

The EPA's efforts for a national program, based on state water quality standards, demonstrated that, although the states were to retain "primary responsibilities" for water pollution control under the act, the EPA was to play a major role in providing guidance and ensuring introduction and

implementation of necessary controls. The new efforts by the agency to implement the TMDL program in areas with impaired water quality were expected to substantially increase the use of innovative approaches in the years ahead.

Effluent Trading

Over the years, there was a growing trend to criticize technology-based regulation as one of the worst manifestations of command-and-control and pronounce them as dictatorial, inefficient, and excessive. Applying water quality-based standards with "perhaps 50,000 [water segments] eligible for TMDLs at an estimated $1 million per study and an order of magnitude times that amount more for implementation, with no assurance of real load reductions at the far end" demanded new approaches (Houck 1997, at 10401). Non-attainment of the desired water quality, especially aggravated by pollution from non-point sources finally became a trigger for the introduction of flexible tools.

According to the EPA estimates, about forty percent of the nation's streams and rivers did not meet the water quality goals set forth by states, Indian tribes, and territories (U.S. EPA 2001). When Total Maximum Daily Loads were allocated, effluent trading was encouraged as a means of lowering compliance costs for affected sources. However, one of the obstacles to trading remained the requirement of the act that all sources, including Publicly Owned Treatment Works, meet all applicable technology-based requirements. In their comments to the EPA proposed effluent trading framework, representatives of industry, regulatory agencies, and some environmental groups challenged this provision to maintain technological prescriptions. Technology requirements significantly limited a number of potential traders (U.S. EPA 2003f).

In 1992, the EPA began to pay serious attention to the possibility of effluent trading to enhance water quality when the Administrator's Conference on Trading Initiative convened. It is important to stress that the agency targeted both point and non-point sources of pollution. One hundred and twenty representatives of federal and state agencies, private firms, and the public expressed their views on trading. They saw effluent trading as a useful tool, but one that had to be applied carefully, with attention to local conditions and with significant guidance from the EPA (U.S. EPA 1992b, 9). Among the concerns raised by participants were the legality and cost-effectiveness of the program, consensus among all affected parties, technical feasibility, modeling, and monitoring. Two of the most noteworthy issues, however, were the fit of currently prescribed controls, such as Best Management Practices, and effluent trading, and extra burdens on states to imple-

ment a new tool. If trading provided greater benefits than current practices, and made a difference in water quality and implementation efforts, then it would be welcome (U.S. EPA 1992b). Participants stressed that if there was proof of such benefits through pilots and demonstrations, trading would be accepted much easier. They agreed that the establishment of a regulatory baseline would be an essential element of effluent trading. The introduction of trading as a flexible instrument mainly required coordination and guidance from a central agency and also ensured that a new instrument would fit the existing regulatory framework and improve on current practices.

In 1996, the EPA strengthened its watershed approach to protecting national waters, as was first outlined in the Office of Water Watershed Protection Approach Framework approved by senior EPA managers in 1991. Guided by the EPA, this integrated environmental management approach established multijurisdictional programs to better approach water quality concerns by building partnerships, identifying priorities, and finding innovative ways to abate pollution. While statutory authority to establish effluent permit trading systems did not exist, the EPA believed that the Clean Water Act allowed effluent trading. The agency issued a draft policy statement that encouraged states to adopt effluent trading systems within their watersheds (61 FR 4994-6, 1996).

The main thrust of effluent trading was to address remaining water quality problems and provide flexibility, while avoiding major challenges to the requirements of the Act. "Trades that depend on fundamental changes in EPA enforcement and compliance responsibilities will not be allowed" (U.S. EPA 1996b, xi). The agency explicitly stated that all minimum permit requirements must be satisfied, thus ensuring fairness, consistency of implementation, and attainment of water quality goals. Since a majority of sources already held NPDES permits, this marketable approach did not increase governmental roles beyond the permitting process. A major benefit of a system of effluent trading was that it involved a minimum change in the existing system. Because all sources were required to hold permits that stipulated maximum allowable discharges, it was a relatively straightforward matter to rewrite permits in a format that would allow effluent trades. "The existence of a well-established institutional framework within which . . . trading can occur simplifie[d] the implementation of the trading programs" (U.S. EPA 1996b, 5–9).

Notwithstanding the similarities in approaches to trading in clean air policy and clean water policy, such as dependence on the existing institutional framework, enforcement provisions, and regulatory efforts in setting up the stage for trading, there was a major difference. While acid rain trading provisions applied nationally, and later several regional and local programs were developed by separate states, the majority of effluent trading programs

became the responsibility of individual states. By 1996, more than twenty states and localities experimented, developed, or attempted to implement trading. The EPA provided guidance, assistance, approval of trading plans, and general recommendations. States and local governments became the entities responsible for initiating and developing trading options.

Not all trading schemes were successful. Initial failures with trading included high start-up costs such as modeling, allocation of responsibilities for cleanup, calculation of pollutant loads, high transaction costs, and monitoring. In 2002, the EPA proposed water quality trading policy building on earlier efforts over seven years, when the agency guided, funded, and provided support for a number of pilot trading projects in different states. The agency emphasized that a proposed policy was intended to be fully consistent with this existing framework and included many provisions intended to ensure program consistency with legal requirements (67 FR 94, 34709-34710, 2002). The EPA identified over thirty-seven projects around the country where states and local governments studied, developed, or implemented trading programs to achieve water quality improvements.

During the House Subcommittee on Water Resources and Environment hearing, effluent trading received support, but on conditions that it would be implemented with clear legal authorities, regulatory baselines, and continuous evaluation (U.S. Congress, House 2002). In January 2003, the EPA announced its final policy on effluent trading as a tool to solve water quality problems on a watershed basis (68 FR 8, 1608-1613, 2003). Effluent trading system allows credits to be sold by those who can voluntarily implement water quality measures to those who need them to achieve regulated water quality standards that they cannot provide by themselves. By 2006, at least ten EPA pilot trading projects have been initiated, and more than twenty state-administered projects have been developed and implemented. Effluent trading becomes a tool to achieve water quality improvement, enhance voluntary incentives, and ease implementation and compliance not only for the regulated entities, but also for regulatory agencies themselves.

Voluntary Approaches

While market-based tools can help enhance the cost-effectiveness of environmental regulation, many problems of pollution control are not fully solved only through such mechanisms. Water quality policy evolved to provide for voluntary and information tools as a mechanism for making the regulatory process more manageable and achieving better environmental results. These voluntary programs provide less tangible rewards such as public recognition, regulation that is more flexible, technical assistance, prevention of high litigation and enforcement costs, and an access to information on

approaches to reduce pollution at lower cost (U.S. EPA 2001c). Both in clean air policy and clean water policy, many voluntary and informational environmental programs have been proposed and implemented by the EPA. The agency encourages and promotes voluntary initiatives for a variety of reasons, including pilot testing of new approaches, demonstration projects, and a lack of legislative authority to establish such programs.

Voluntary instruments bring together the EPA's partners: private-sector and public-sector facilities, other government agencies, trade associations, and communities. These stakeholders assess new approaches that propose solutions to difficult regulatory or technical problems, usually at a lower cost or decreased regulatory burden for the project sponsor (U.S. EPA 2004c). As well as in clean air policy, these programs include environmental audit protocols, Environmental Management Systems, Performance Track and others (see chap. 3). Under the Clean Water Action Plan and through the Project XL, the EPA thought to streamline procedures for measuring pollutant loadings for industrial wastewater dischargers (U.S. EPA 2002c). In October 2006, EPA and USDA's Natural Resources Conservation Service signed a Water Quality Trading Partnership Agreement to advance water quality credit trading markets through cooperative conservation. The agreement embraces a pilot project within the Chesapeake Bay basin to demonstrate the effectiveness of environmental markets. Under voluntary projects and partnerships, participants have increased operational flexibility, such as expediting or consolidating permitting, reducing the amount and frequency of recordkeeping and reporting, and supporting innovative technology. However, it is important to note that there are many more national voluntary programs, especially specific programs, for air quality control than water quality policy. This is due in part to the strict provisions of water law, and in part to the fact that the amount of pollution released into waters was "less than one-fifths the amount of pollution discharged into air" (O'Leary 1993, 23).

There are many difficulties and barriers to the development and implementation of voluntary programs in water policy. Implementation of negotiated agreements is slow because Congress did not give the EPA the authority to offer sources a relief from technology forcing. Regulated sources themselves are very cautious of instituting such programs because of the absence of clear legal authority for such projects and vulnerability to citizen lawsuits based on traditional requirements. Voluntary programs will suffer even further if they do not delineate all conditions and requirements or make projects prohibitively restrictive (Steinzor 1996). Building on experience, the EPA expanded "available legal mechanisms beyond enforcement discretion to include permits, waivers, variances, interpretive statements, site-specific rules, and deviation from existing practices and policies as allowed by statute" (62 FR 19872–82, 1997; Lund 2000 at 10142).

The most important feature and a precondition for voluntary programs is the establishment of a baseline for performance. While voluntary projects provide for flexibility, they have to assure that environmental goals are met. In addition, because voluntary projects do not have clear legislative authority, they must operate within a current system of regulation, based on permits and other statutory requirements. However, such innovative projects contribute to implementation capabilities of the regulatory agencies. Project XL allowed the EPA to create and test two new compliance options that became part of the agency's new pulp and paper cluster rule (63 FR 18504, 18509, 18523, 1998; Lund 2000). It also helped to broaden and sharpen EPA's experience with stakeholder involvement. Designing and implementing voluntary projects provide a regulatory agency with the increased ability to make agency-wide decisions that are "both consultative and timely" (Lund 2000 at 10152).

CONCLUSIONS: REGULATORY INNOVATION AND INCREMENTAL CHANGE

For more than thirty years, water quality policy in the Unites States has been central to federal and state governments, private firms, environmental groups, and the public at large. Billions of dollars have been spent on wastewater treatment and significant results have been achieved to control pollution.[7] Few people doubt the value of clean water supporting multiple human uses and aquatic ecosystems. The debate focuses on more pragmatic concerns, that is, how to best accomplish the accepted imperative.

Early attempts to deal with water pollution repeated a path similar to that of air quality control. Policies prior to 1972 had little impact on the problem. Growing disappointment led to the enactment of an ambitious and overly restrictive law. There has been an almost exclusive reliance on detailed central regulation, qualified prohibitions under which the discharge of pollutants was prohibited except in accordance with permits, and on court enforcement. Policy on water pollution control, however, emphasized generous federal subsidies for the construction of waste treatment plants by municipality and industries.

A regulatory model, such as regulation coupled with subsidies, is credited with considerable successes in achieving improved environmental performance by industry and municipalities. For significant additional progress in environmental protection to happen, traditional approaches should be reevaluated and new approaches considered. The introduction and sustenance of innovative flexible instruments do not depend on wishful thinking only. They are also never based just on calculations of costs and benefits

and the logic of rationality that if one tool is less costly than another, then the former must be applied. It strongly depends on the existing regulatory requirements and governmental leadership.

The case of water quality policy in the United States clearly demonstrates a significant influence of the traditional regulatory framework on the introduction of flexible tools. The elevation of policy responsibility to the federal level produced mixed results. While concentration of policy authority in the EPA resulted in the agency's leadership to introduce multiple innovative tools and provide guidance to the states, initially the EPA was stifled by the strict statutory requirements. Several states established water permit fees and experimented with effluent trading. The EPA is still commended for its efforts to provide flexibility and encourage the states to apply innovative approaches. The agency introduced variances for permits, promoted water quality-based regulations, advanced a framework for effluent trading, and, most important, supported multiple voluntary projects to facilitate compliance and achieve better environmental results. Moreover, when the states may find it difficult to cope with traditional direct regulations, the federal government's greater insulation from powerful local interests gives it the opportunity for leadership.

Most important is that the type of a traditional regulatory framework or extant standards determines the fate of flexible tools. Technology-based standards are very different from performance or harm-based standards. The former explicitly prescribes the way pollution control has to be undertaken, which limits the space for innovation and flexibility. Following the intent of Congress, the EPA and state agencies could not help following technology forcing. Considering or applying other tools, while technology deadlines were pressing, would place enormous strain on the regulatory bodies. Only when a greater shift to water quality standards occurred did the regulators turn their efforts to developing various techniques, including trading. As well as in clean air policy, ambient standards represented a goal to be achieved, not the method. Attempts to improve water quality after technological controls were in place led to the introduction of more flexible tools.

Trading and voluntary approaches preserved minimum levels of water quality protection by maintaining minimum technology requirements. Using existing practices as a measuring rod for implementing flexible tools added reliability to new tools. Because regulatory agencies could not use as much discretion as to override congressional intent, they avoided political struggles by preserving the existing scheme. The only caveat here is that the introduction of flexible instruments may be slower if they are not used to comply with existing requirements, but are employed strictly in addition to them. However, applying enforcement mechanisms in case of noncompliance with trading rules or voluntary projects preserves the credibility of flexible approaches.

Finally, the challenge of persistent problems and difficulties in attaining established goals through traditional methods facilitated the introduction of flexible instruments. Regulatory agencies still encounter setup costs with flexible tools. However, when technology-based regulation and non-point source practices could not produce the desired water quality results, it was agreed that other approaches should be used. Under EPA guidance, voluntary and trading programs facilitate implementation of water quality standards, lessen the costs of compliance with the law and regulations, create incentives for voluntary pollution reductions, promote watershed-based initiatives, and fight non-point source pollution.

Obviously, there are much broader implications of the introduction of flexible tools with respect to regulatory practices, modes of governmental action, and governance processes. Traditional modes of regulation are usually established to ensure stability and in many cases to prevent radical change. However, complexities of contemporary policy issues, especially in environmental policy, challenge routinization of governmental practices and require new approaches and governing mechanisms to manage them. The concept of governance is emerging to encourage our understanding that achieving public purposes today demands greater contributions and interactions among government and societal actors, as well as the development of innovative strategies. To move beyond direct regulation requires the adoption and use of extralegal means to achieve public policy goals and a dissemination of these innovative practices through coordination, guidance, and delegation of authority to the local levels, economic entities, and public at large.

Institutionalizing governance or reinventing modes of governmental functioning involves attention paid to the pace, timing, and regularity of reforms and innovations. While incremental change may seem as frustrating to instituting governance mechanisms, policy reforms are fraught with challenges in adjusting to or creating new institutional makeup, organizational culture, and values. To sustain long-term governance efforts it is important to avoid a threat of short-term failures by laying the ground to promote *continuous* incremental change. A regular and steady flow of changes and innovations could bring an accelerated general improvement in policy performance in a much faster way than dramatic transformations, which could create opposition and lasting political tensions in government and society.

The U.S. water quality case, as well as many experiences of reform around the world, demonstrate an incremental character of policy innovation. Initial institutional structures, policy design, and choices function as a filter for the introduction and implementation of particular policy instruments. Adopted practices and institutional routines do not change easily. Once policy strategies are adopted, it becomes very difficult to change the rules because it implies significant uncertainty and places additional burdens

on policy actors. While change is inevitable, any policy innovations build on previous practices and experiences, and are constrained by a broader institutional context. This is why well-designed incremental actions could bring improvement in policy functioning and performance and lead to more effective solutions to policy dilemmas. The next two chapters on the Russian air and water quality policies will also reveal the significance of timing and institutional legacy on policy choices and the introduction of flexible tools to improve environmental quality.

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CHAPTER 5

Pollution Charges and Their Discontents

Russian Air Quality Policy

As the previous chapters on air and water policy instruments in the United States demonstrated, initial pollution prevention policies emphasized direct regulation exemplified in standards, strict deadlines, and penalties. Gradual transition to the use of flexible instruments was possible due to the efforts of a regulatory agency, the EPA, which has been introducing innovative approaches based on the existing regulatory standards. In Russia, initial air quality policy also took the form of command-and-control. The similarity of regulatory principle in both countries is evident. The notion of a common regulatory principle suggests that the practice of environmental regulation tends to converge in complex, industrialized, bureaucratic countries: regulation by environmental area, national or regional standard setting, mandated technology, delegation of implementation authority to administrative agencies, and a date-certain principle.

Nevertheless, there are obvious differences in the setup of an environmental policy authority, strictness of regulations, relationships between industry and government, and the role of law in the United States and Russia. In Soviet Russia, from the time of Lenin there was heavy reliance on legal restraint and good intentions. Soviet law, in contrast to Western law, did "not claim to be 'neutral' or indifferent to social forces" (Ziegler 1987, 78). Formal law represented an official image of governmental intentions, but in many cases stayed rather declarative and idealistic, appealing to individual virtues and carrying an educational character. Governmental regulations, by contrast, tended to be more substantive, prescriptive, and efficient. Today, law in Russia is more detailed and efficient, but it is still less exhaustive or prescriptive than American legislation. Changes in Russian law are to a

large degree due to the transition to market-oriented economy. Russian law nowadays delineates many aspects of resource ownership and responsibility for resource use and control. This contrasts with the Soviet law, whereby the state was virtually the sole owner and protector of natural resources.

The dispersal of policy authority has been haunting Soviet and post-Soviet Russian environmental regulation. The strictest standards in the world did not provide either adequate enforceability or flexibility to the industries. Because industry was a part of government in the former Soviet Union, the antagonism assumed between government and industry in the environmental area, as in the United States, was not strictly operational. The political weight of economic interests encouraged a utilitarian environmental ideology, unattainable standards, and planning that mandated compliance within an unrealistic time limit. While there are noteworthy differences between the Soviet and post-Soviet approaches to environmental legislation and regulation in Russia, the main features of standard setting and administration today borrow heavily from the Soviet period. The present system of flexible instruments, such as emission charges, provides an incentive for industry to comply, but in many cases it also serves as a revenue-raising mechanism and an aid to carry out environmental projects for the government.

Several patterns in the development of policy instruments are observable in Russian air quality policy. Main environmental policy tools in use today are still for a large part based on old principles. Two factors, however, suggest that there is an important role for the application of flexible and, in particular, economic instruments to air pollution control in Russia. First, the magnitude of the costs required to meet air quality objectives necessitates the government to consider economic instruments. Second, Russia already has legal and regulatory foundation to impose emission fees and fines on polluters.

The functioning of an existing institutional framework still makes the establishment of flexible instruments difficult. The major structural impediment that Russia inherited from the Soviet era is the fragmentation of administrative responsibilities and constant bureaucratic reorganization. While the centralization of authority is still a significant trend, the lack of an independent federal environmental agency and a duplication of functions among various agencies contribute to the difficulty of using flexible instruments. However, similar to the United States, flexible approaches are mapped onto the existing institutional framework and noncompliance fees are used to ensure accountability in Russia. The system of emission charges in Russia was integrated into an existing system of emission limits in which maximum permissible levels of pollution were established and permits issued for each enterprise based on ambient quality standards. The introduction of flexible instruments in both countries aims to provide incentives for enterprises to reduce negative impacts on air quality. While in the United

Table 5.1 Development of Air Quality Control Laws and Regulations in the Soviet Union and Russia

Year	*Legislative/Regulatory Activity*
1948	The USSR Ministry of Health establishes first ambient air standards—Maximum Allowable Concentrations (MACs)—for ten air pollutants
1949	The USSR Council of Ministers resolution prohibits the construction or modification of industrial facilities that do not provide for emission controls
1960	RSFSR Law on Protection of Nature
1972	Joint Resolution of the Party Central Committee and the Council of Ministries of the USSR to Strengthen Environmental Protection and the Rational Development of Natural Resources
1974	Incorporation of environmental protection into the State Plan
	Government provides subsidies to enterprises
	Creation of environmental sections in state committees and enterprises
1978	Joint Resolution of the Party Central Committee and the Council of Ministers on Additional Strengthening of Environmental Protection and the Rational Development of Natural Resources
	Maximum Allowable Concentrations are established for 218 air pollutants
	An incentive system of bonuses and awards for enterprises and workers is made contingent on enterprise's fulfillment of its plan
1980	The Law on Protection of Atmospheric Air establishes the interim standard of the Temporary Agreed-upon Emissions (TAE)
	The Law authorizes material and moral incentives for implementing air quality controls
1982	The USSR Council of Ministers Resolution of January 8, 1982, designates new norms for the Maximum Allowable Concentrations of pollutants into the atmosphere
1988	Joint Resolution of the CPSU Central Committee and the USSR Council of Ministers on the Fundamental Restructuring of Environmental Protection in the Country
	Establishment of an independent and centralized organ for pollution control—State Committee for Environmental Protection (Goskompriroda)
	Experiment with pollution charge system in the twenty-nine regions

continued on next page

Table 5.1 *Continued*

Year	*Legislative/Regulatory Activity*
1991	Law "On Environmental Protection" and the Regulation of the RSFSR Council of Ministers establishes the system of pollution charges
1992	R.F. Governmental Regulation On Establishment and Calculation of the Chargers for Environmental Pollution, Disposal of Wastes, and Other Negative Impacts
	Introduction of nonmonetary settlements or exemption from pollution charges—pollution charge offsets
1994	Goskompriroda elevated to the status of the Ministry of Environmental Protection and Natural Resources of the Russian Federation
1996	The Ministry of Environmental Protection and Natural Resources is reorganized into the State Committee on Environment (Goskomekologiia)
1999	Law on Protection of the Atmospheric Air emphasizes the economic approach to air quality control through emission charges
2000	Goskomekologiia is abolished as a central environmental agency and its functions are transferred into the Ministry of Natural Resources (RF MNR)
2002	Federal Law on Protection of the Environment reinforces the polluter-pays principle, but does not establish the mechanism for calculating and imposing charges
	Lawsuit on the legality of charges brought by industry
	Supreme Court abolishes the pollution charge system
	Constitutional Court reestablishes the system of pollution charges
	Introduction of the Bill of the Law on Charges for the Negative Impact on the Environment
	Introduction of the refunded emission payments scheme
2004	Law on Charges for the Negative Impact on the Environment is considered in the Government of Russia in November 2004, and in State Duma—in December 2004
2006	State Duma Committee on Ecology calls for the adoption of the Environmental Code and the creation of an independent environmental agency

States, however, flexible tools serve also as an implementation aid to agencies themselves, in Russia the generation of revenue became a key goal. Table 5.1 summarizes the development of air quality policies and instruments in the Soviet Union and Russia.

This chapter goes through four stages explaining the evolution of air quality laws, policies, and regulations. First, there is a brief historical overview of the initial governmental response to air pollution problems. This is followed by an examination of the location and nature of Soviet environmental policy authority to demonstrate the elevation of air quality problems to the institutional agenda and the importance of clean air regulations in the Soviet centralized planning mechanism. Third, an analysis of the first comprehensive air quality law, regulatory techniques, and initial incentive mechanisms explain how the historical and institutional factors shape the adoption of policy techniques. A groundbreaking policy development—the establishment of a centralized environmental agency in 1988—is examined to demonstrate the importance of an independent environmental authority for the introduction of flexible instruments. Finally, contemporary policy struggles over the system of pollution charges portray the uneasy development of flexible controls in law and regulations. The conclusion to this chapter demonstrates a continuing influence of the traditional regulatory structure on the introduction of flexible instruments in Russia.

EARLY ATTEMPTS AT AIR QUALITY CONTROL

Environmental protection in general and air quality control in particular were overshadowed by a need for postwar industrialization up until the late 1950s. Nonetheless, the Soviet Union actively conducted research as indicated by the fact that sixty-five percent of all world literature on air pollution control by 1948 originated there, and a large number of decrees and resolutions appeared during the period from the year 1917 to the 1950s (Goldberg 1960). By 1948, the USSR Ministry of Health established the first ambient air standards, Maximum Allowable Concentrations (MACs), for ten air pollutants (Mote 1978). Most standards and laws tended to be conservationist in nature and aimed at complete and efficient utilization of resources (Zhevlakov 1996). The majority of standards, however, were too strict to be technically feasible and legally enforceable.

In 1949, the USSR Council of Ministers passed an impressive resolution "On Measures in the Struggle Against Pollution of the Atmosphere and on Improving Sanitary-Hygienic Conditions of Populated Areas." This resolution instructed the State Sanitary Inspectorate within the USSR Ministry of Health to prepare sanitary and hygienic standards, monitor

harmful emissions, and authorize the operation of new and modified sources of pollution (Izmerov 1973). Additional high-level air protection activities included the establishment of the Commission on Protection of Nature at the USSR Academy of Sciences in 1955 to do research on air quality. These developments represent a notable parallel between the early attempts at air protection in the United States and Russia since initial efforts in both countries aimed at research, and air protection authorities originated within the departments of health.

Between 1957 and 1963, during the period of relative decentralization, the fifteen Union republics that comprised the USSR all passed some form of nature protection laws with provisions for air quality control (Komarov 1978; Brinchuk 1985). In the Soviet Union, similar to the U.S. experience, subnational jurisdictions were mostly active in clean air policies, with federal legislation following.

The most significant of the Soviet republican laws was the conservation law enacted by the Russian Soviet Federative Socialist Republic (RSFSR); in it Article 12 dealt with air pollution control. The law required the installation of recuperation plants to prevent harmful air emissions (RSFSR Law on Protection of Nature 1960). There were two main drawbacks to the law. First, it was too general. It included measures on using and conserving natural resources, as well as maintaining air quality and improving aesthetic qualities of the environment. Second, the attention paid to conservation related to the inefficiencies in the system of central economic planning that became acute after Stalin's death. However important this environmental law was, Russia lagged behind all republics in setting up its own republican committee for environmental protection to coordinate the republic's environmental regulatory and control functions.

INSTITUTIONALIZING ENVIRONMENTAL POLICY

By the 1970s, environmental protection had become a priority in the highest echelons of power in the USSR. Its primary expression is found in the 1977 USSR Constitution, which provided for the rational use of natural resources and preservation of environmental quality (Article 18). The Constitution upheld a principle of state ownership of natural resources. While resource ownership was unified, administration, regulation, and utilization of environmental resources were dispersed among a large number of state departments and ministries. This fragmentation of authority greatly affected the development of pollution control policies and instruments. Direct regulation requirements and standards were a result of complex negotiations between committees and ministries responsible for environmental protection and

economic development. Even a system of bonuses and rewards for environmental performance, which was introduced into policy guidelines and regulations, did not provide much flexibility. Initial incentive schemes were a product of the Party policy of socialist competition[1] developed within an established regulatory framework and a modest supplement to a command-and-control approach.

Central Policy Provisions

In the Soviet Union, primary policy authority was located at the top of the system with the Supreme Soviet, the Central Committee of the Communist Party of the Soviet Union (CPSU), and the USSR Council of Ministers. These bodies issued major policy directives based on the guidelines formulated in the five-year plans adopted by the CPSU Congress. Policy provisions were a result of a complex process of negotiation between organs of general competence, or supervisory state committees, and specialized organs responsible either for a branch of economic production or for a particular field in the environment (Ermakov and Sukharev 1997). Figure 5.1 delineates the basic structure of federal agencies responsible for environmental policy and administration in the Soviet Union.

While the right to approve and pass legislation, and therefore design the means of intervention, was vested in the USSR Supreme Soviet, the CPSU Central Committee and the Council of Ministers took an active part in initiating general environmental and air quality legislation. During the 1970s, the government produced two seminal resolutions and numerous air quality standards, and incorporated environmental and air quality indicators into the planning mechanism of the country. A fundamental document for environmental protection became the Joint Resolution of the Party Central Committee and the USSR Council of Ministers to "Strengthen Environmental Protection and the Rational Development of Natural Resources" (USSR Joint Resolution 1972). It made an effort to strengthen air quality controls and centralize air quality monitoring in the State Service on Hydrometeorology (Hydromet) (Blinov 1978). The resolution also called for the organization of environmental councils in various ministries and their subordinate units.

This policy document was significant, but it did not establish specific means for the implementation of air quality policy. All standards and emission limits were to be developed by multiple agencies, including the State Committee on Standards, Hydromet, and the Ministry of Health. However, a more detailed approach to environmental protection in general and air quality control in particular came with the establishment of a Comprehensive Resource Use and Environmental Protection Plan in 1974. In consultation

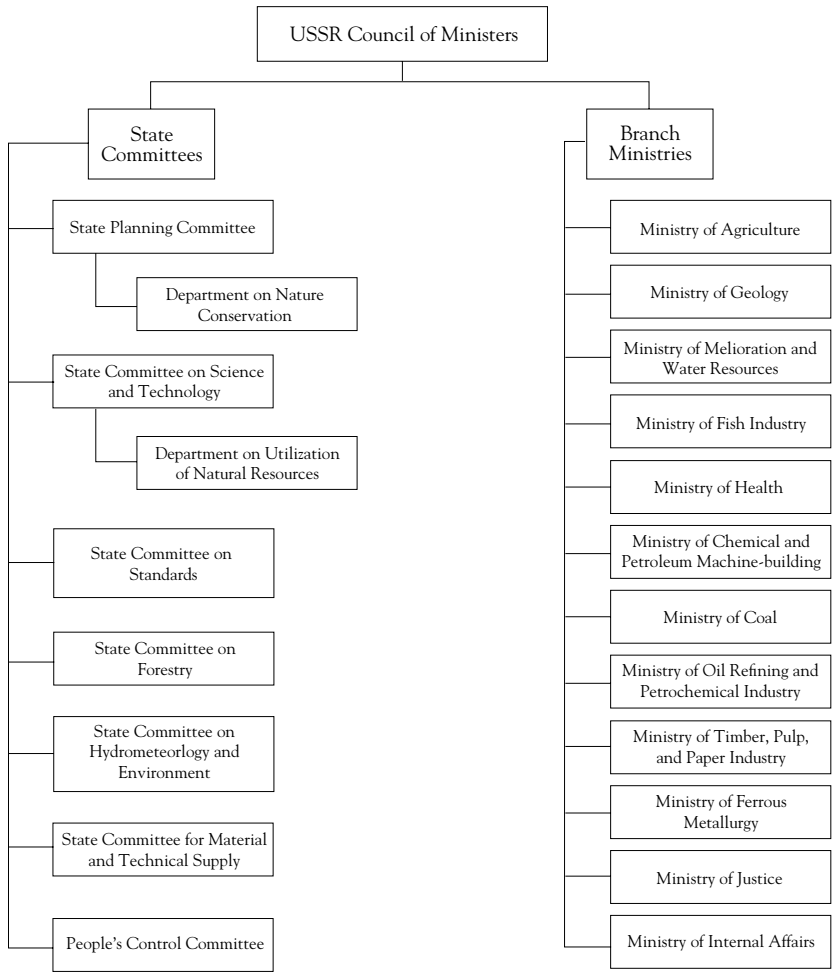

Figure 5.1 Basic Structure of the Federal Environmental Administration in the Soviet Union (1980)

with resource ministries, the State Planning Committee (Gosplan) generated concrete directives together with budget allocations for new environmental investments (Petrov 1984). The environmental plans authorized governmental financial assistance to industry and agriculture. While enterprises were expected to allocate fifteen to twenty-five percent of the capital funds for pollution control equipment from their basic funds, the government provided subsidies.

Capital investments in pollution control and utilization of resources for the 1976–1980 five-year plan amounted to one and a half percent of the total state investment, or about eleven billion rubles (Komarov 1978, 96). In the tenth five-year plan, about nine percent was allocated to air pollution control (Statistical Collection 1980; Public Spending 1979). The funds were allocated from the central investment fund directly to a branch ministry or a republic. The lack of control over the distribution of pollution control funds placed environmental agencies in a weaker position politically, in comparison to wealthy industrial polluters. This policy style, in Theodore Lowi's terms, was distributive rather than redistributive, minimizing both political costs and policy effectiveness, which limited the bureaucratic opposition to the leadership.

A concept of comprehensive planning guided administrative agencies to work toward attaining specific goals expressed in standards and norms for particular areas, established by the State Committee on Standards and Central Statistical Committee (USSR Council of Ministers 1975). Territorial plans were developed for air quality control in all cities and industrial areas based on the Central Committee and the USSR Council of Ministers resolution "On Improvement of Planning and Increase in Impact of Economic Mechanism on the Effectiveness of Production" (USSR Joint Resolution 1979).

The Joint Resolution of the CPSU Central Committee and the Council of Ministers of 1978 went further in updating environmental and air quality policy. Although it did not create a single independent environmental agency, it elevated Hydromet to a State Committee of Hydrometeorology and Environment (Goskomgidromet), and granted it autonomy from the ministerial system (USSR Joint Resolution 1978). The resolution entrusted Goskomgidromet with the organization and operation of a monitoring system, the examination of projects for new and modified facilities to ensure that these meet established air pollution control regulations, on-site inspection of enterprises regardless of their ministerial subordination, and the right to suspend operations if air quality standards were violated (Kolbasov 1983; Brinchuk 1985). Goskomgidromet became the lead agency for air pollution control, however, without exclusive jurisdiction over pollution control.

The 1978 Resolution also attempted to introduce an incentive scheme for enterprises to abate pollution. It required that a system of bonuses and awards for enterprises and workers be made contingent on an enterprise's fulfillment of its plan, including an environmental section, not just production norms (USSR Joint Resolution 1978). This linking of a bonus system to environmental performance represented a concrete step toward providing economic incentives for environmental protection.

As in the United States during the 1970s, the Soviet system of policy making was the focus of political activity at the federal level. While the republics were the first ones to realize the danger of pollution, their efforts

were suffocated by branch planning after Khrushchev's experimentation with territorial planning (Kushnirsky 1982). Implementation of environmental policy, control over financial and material resources, as well as organizational authority came from the top, with regional and local authorities yielding to national plans. In the theoretical aspects of central environmental and economic modeling and planning, the USSR probably went further than any other country. However, unresponsiveness of the planning mechanism to long-term development encouraged narrow policy reforms. Modifications of environmental policy and planning, such as changes in policy directives or incentive structures, had been limited in their objectives and less radical in their effects.

Dispersal of Policy Authority

Policy directives and resolutions defined objects, subjects, and principles of environmental protection, but did not establish standards, planning procedures, and fines associated with enforcement. The task of giving law a concrete expression belonged to the USSR Council of Ministers and various ministries and committees. Governmental resolutions tended to assume a greater importance, since they established the obligations of each ministry and state committee in the implementation of a specific law or resolution.

Based on two Joint Resolutions, multiple ministries started developing emissions limits for industrial enterprises, subject to approval by Goskomgidromet and the Ministry of Health. Air quality standards became State Standards (GOST) for emissions limits (USSR Council of Ministers 1975). The State Committee on Science and Technology also ordered Goskomgidromet, Gosplan, the Ministry of Education, and other state committees to develop methods for calculating the economic damage of air pollution. The State Planning Committee and the State Committee on Construction were responsible for controlling new and modified sources of emissions. None of the agencies thus had complete jurisdiction over air quality policy. Table 5.2 represents the distribution of functional responsibilities among different agencies with regard to air quality control.

A characteristic feature of the system was the presence of state organs responsible for regulation and administration of pollution control and agencies responsible for utilization of natural resources. This separation of administration and use established a relationship between a regulator and a user similar to the one in the United States between a private company and a regulatory agency. However, agencies responsible for environmental administration and control in the Soviet Union were in many cases subordinate to the economic ministries (Kolbasov 1976; Komarov 1978).

Coordination of pollution control suffered because agencies focused on meeting what they perceived to be their priority targets, that is, production.

Table 5.2 Distribution of Functional Responsibilities for Air Quality Policy among Governmental Agencies in the Soviet Union

Functional Responsibility	*Governmental Agency*
Research and Planning	State Planning Committee
	State Committee on Construction
	State Committee on Science and Technology
	State Committee on Hydrometeorology
	State Committee on Forests
	State Agro-Industrial Committee
	Ministry of Health
	Ministry of Melioration and Water Resources
	Academy of Sciences
Utilization	State Committee on Construction
	State Committee on Hydrometeorology
	State Agro-Industrial Committee
	Ministry of Justice
	Ministry of Health
	Ministry of Oil Refining and Petrochemical Industry
	Ministry of Chemical and Petroleum Machine Building
	Ministry of Coal
	Ministry of Fish Industry
	Ministry of Timber, Pulp and Paper Industry
	Ministry of Melioration and Water Resources
Enforcement and Control	State Committee on Construction
	State Committee on Hydrometeorology
	State Agro-Industrial Committee
	Ministry of Justice
	Ministry of Health
	Ministry of Chemical and Petroleum Machine Building
	Ministry of Coal
	Ministry of Fish Industry
Expertise	State Committee on Construction
	State Committee on Science and Technology
	State Committee on Hydrometeorology
	State Committee on Forests
	Ministry of Health
	Ministry of Oil Refining and Petrochemical Industry
	Ministry of Timber, Pulp and Paper Industry
	Ministry of Melioration and Water Resources
	Academy of Sciences

Sources: V. V. Petrov. *Pravovaia okhrana prirody v SSSR (Legal protection of nature in the USSR)*. Moscow: Iuridicheskaia Literatura, 1984.

Whenever a multiplicity of semiautonomous institutions, each with its own highly specialized jurisdictional sector, attempted to work together, institutional tension was unavoidable (Brinchuk 1985). Such multiple and partial administrative authority undermined efficient regulation, monitoring, and enforcement activities. The successful realization of large environmental projects required creating an independent supervisory authority with power to induce collaboration among the institutions involved (Lunev 1981; Nove 1982; Brinchuk 1985; Jancar 1987). In the United States, the EPA became such an authority. In Russia, the Department on Utilization of Natural Resources, attached to the Committee on Science and Technology, and the Department on Nature Conservation of the State Planning Committee had no particular power. Various departments and committees were obliged to conform to their main objectives, which were not oriented toward nature protection (Komarov 1978). This attention to material development and fragmented structure of Soviet administration impeded the development of consistent environmental policies.

The implementation of the incentive scheme provision also suffered from this dispersal of policy authority. A system of bonuses came from the principles of socialist competition, and enterprises received a large number of environmental rights to participate in this system. Yet, in planning their environmental targets and creating environmental councils, enterprises had to respond to multiple ministries for the fulfillment of environmental standards. Prior to the formation of a factory's environmental performance criteria, supervising ministries had to issue regulations and guidelines setting forth a procedure to form environmental sections. Local factories were required to reach an agreement with the towns in which they were located on how environmental regulations were to be implemented in that particular area. Given the complexity of the process described, many Soviet enterprises continued functioning with either only environmental statements or without enterprise regulations.

The dispersal of decision-making and administrative authority indicated the success of central organs in resisting further centralization efforts and protecting or increasing their jurisdictions. The lack of a single independent environmental agency inhibited the development of an effective direct regulatory system to control air pollution, let alone the adoption and implementation of comprehensive innovative flexible schemes.

INSTRUMENTS AND STRATEGIES

The Soviet Union practiced direct regulation to control air quality, notwithstanding modest provisions in a system of rewards for environmental

performance. Air quality standards were based on health considerations and the system of Maximum Allowable Concentrations (MACs) in the atmosphere for 218 different pollutants, which designated the optimum level of ambient air quality in a given area. In comparison, the U.S. Clean Air Act initially mandated ambient air standards for only six categories of pollutants (see chap. 3). Uniform air quality standards applied to the whole territory of the Soviet Union, with the exception of recreational zones (Zabarin and Kozhanov 1978; Brinchuk 1985). Ambient air quality standards did not take into account economic or technological feasibility. Why wasn't attention paid to technological feasibility and legal enforceability? One of the answers is the Party and governmental concern about the health and well-being of the population. However, another reason for these strict standards would be a sign of what a socialist system could do (Goldman 1972). More likely, such standards were regarded as ideals toward which humans must aspire, as was suggested by Professor Riazanov, chair of the committee that developed initial air quality standards (Riazanov 1952, 1960).

Emission levels for each enterprise were established based on a locality's mandated MAC for individual pollutants, the number of enterprises in the area, and the degree to which each pollutant contributed to the ambient air level of a pollutant in question (USSR Council of Ministers 1975). In addition, in an effort to control air pollution, specific technology requirements appeared in regulations. Pollution control technology development was centralized under the Chief Unit on the Development of Gas Purification and Dust Catching Equipment within the Ministry of Chemical and Oil Machine Building. The State Committee on Hydrometeorology, the Ministry of Health, and the State Committee on Standards had to approve and implement new technological solutions in cities and industrial centers. Moreover, sanitary standards governing planning and construction of industrial facilities required proper location of sanitary zones around enterprises (RSFSR The Legislation on Capital Construction 1978). The main requirement was a clear-cut functional zoning into industrial and residential areas (Izmerov 1973; Brinchuk 1985).

As a true command-and-control approach, Soviet air quality regulations relied on enforcement provisions. All enterprises had to obtain a permit to pollute, and to submit a separate document usually titled "Measures to protect atmospheric air from pollution" to the State Committee on Hydrometeorology and Environment (Brinchuk 1985). While Sanitary Epidemiological Service at the USSR Ministry of Health was one of many specialized agencies responsible for enforcement, it left the decision as to the degree of severity and type of permit violations to the Union republics (Principles of Legislation on Public Health 1969). During the 1970s, the republican criminal codes were updated to include environmental offenses. Under the RSFSR

Criminal Code, certain forms of air pollution were criminal offenses carrying a prison sentence of three years. Administrative sanctions ranged from moral sanctions and fines to an order of closing down an offending enterprise, loss of employment, a disciplinary action, and a restitution of the damage. Local Soviets, however, had difficulties enforcing the law when their local factories were under a powerful central branch ministry (Kramer 1978). A compromise that occurred in setting emission levels, instead of a provision of incentives to comply, was a significant factor in enforcement.

The system of air quality control in Soviet Russia was a command-and-control approach. However, policy guidelines were very generalized: "All these laws were declarative and did not cover the full variety of complex relationships in the sphere of nature protection" (Aksenok 1969, 79). Standards and regulations were issued by a multiplicity of ministries and state committees at the Union and republican levels, which in many cases were sensitive to local conditions and needs of a specific industrial-territorial complex. This resulted in a big variety of standards rather than provision of flexible means to achieve the standards. It was safer for the regulatory agencies to adhere to some known methods and instruments of pollution control rather than experiment with innovative approaches.

Incentives to Protect Air Quality

A review of Soviet air quality policy and regulations demonstrated that there was a modest system of incentives to control air pollution. This system was a result of joint efforts by the Party and the USSR Council of Ministers. The willingness to experiment with the use of incentives increased during the post-Stalin era yet old tested ways continued to hold.

Government believed that abatement measures could not be achieved with a "stick" alone (Danilenko 1989). Moreover, direct regulation itself was oriented more toward issuing directives rather than providing adequate enforcement. In part, it was due to one of the central principles of Soviet law, that is, its educational and socialization function (Brinchuk 1985). "The specificity of socialist law lies in the fact that sanctions do not provide for obligations and restriction in any particular case . . . the law carries educational and persuasive character" (Marxist-Leninist general theory on state and law 1973). The law was more than a mechanism of outlining prohibitions and sanctions for noncompliance. A development of citizens' moral character and their awareness of environmental reality were important. The Soviet system of command-and-control carried elements of informational or persuasive instruments: "the law ha[d] large psychological meaning in the formulation of progressive societal opinion and environmental worldview of the soviet citizens" (Strautmanis 1978, 135).

Although the goal of Soviet law was to raise environmental consciousness, this task was difficult because all natural resources were state property, which reduced the incentive to care about natural resources. With regard to the atmospheric air, there were multiple debates, though. According to Soviet scholars, air could not be considered either state or private property due to its natural characteristics, and that is why it could not be assessed monetarily (Stainov 1974; Brinchuk 1985). Thus, a "polluter-pays" principle was considered and rejected on technical and ethical grounds. The principle was first introduced in 1970 by Professor Lemeshev, who proposed a system in which enterprises had to include in the cost of production the value of natural resources polluted, measured by the cost to restore them. These pollution criteria could be made one of the indices of an enterprise's performance, and then every factory would have an economic interest in polluting less. In many respects, this system could have brought about positive changes in air quality protection. Critics, however, argued that an incentive mechanism for product price regulation would be too complicated and eventually would function poorly (Komarov 1978). More serious objections were ethical. In a "polluter-pays" principle, it would be advantageous for industries to abate only when the costs of pollution exceeded the costs of abatement measures.

The only incentives that the government authorized for industries were a system of bonuses and awards for enterprises for superior environmental performance. A large part of this incentive system was based on the principles of socialist competition. Socialist competition in the sphere of environmental protection was designed to achieve maximum results in pollution abatement and had a voluntary character to a certain degree (Danilenko 1989). The major difficulty with the environmental bonus system was the likelihood of a long-term viability of such a solution. Scholars indicated that the bonus system did not stimulate managers to fulfill the objectives desired by the leadership, but rather kept plan targets as low as possible in order to be able to meet them and qualify for bonuses (Nove 1982; Kushnirskii 1982). When environmental indicators were first introduced, an enterprise manager could easily ignore them in favor of the production norms with their attendant rewards. When the implementation of environmental controls was tied to the bonus, a factory's interest also shifted to the planning of incremental improvements rather than major environmental measures.

Soviet legal scholars specifically argued that the introduction of the bonus system was not sufficient. A factory manager would only do what was necessary when planned profits were attacked. Petrov recommended that a system of disincentives, or fines levied for noncompliance, be increased to make a difference in a factory pocketbook, and that, contrary to the

established practice, these fines should be counted against planned factory profits (Petrov 1980, 1984). However, systemic constraints on Soviet agencies responsible for air quality protection inhibited their cultivation of aggressive tactics. The environmental agencies were most successful at incremental approaches and accommodation, while they were less effective at undermining the power of the economic ministries to decide when and how to comply with the law (Bardach 1977; Matthews 1978; Jancar 1987).

The development of incentive-based flexible approaches suffered because economic ministries minimized the costs of pollution by passing them onto other organizations as externalities, and environmental regulatory agencies and enterprises themselves were reluctant to experiment with approaches that could have jeopardized the attainment of production quotas.

POLICY REFORM

The tasks of the Soviet air protection policies grew from the regulation of social relationships to the enhancement of legality in the domain of air protection. After eight year-long negotiations, the first Soviet Law on Protection of Atmospheric Air (LPAA) went into effect on January 1, 1981 (USSR LPAA 1980). A crucial issue was whether to establish a separate environmental agency to take charge of air pollution control. The final bill that became law was an apparent loss for the environmental agency. Although it gave sole responsibility to authorize emissions to Goskomgidromet, it left old ministerial provisions in place (Article 10). In the implementation stage, air quality policy was to be divided into sets of multiple regulations: "Draft plans for air protection developed by ministries, state committees and departments . . . must be agreed with the agencies exercising supervision over air protection" (USSR LPAA 1980, Article 6).

The length of time between the draft of this law and its adoption was an indication of the strength of different interests. Industry's position in Soviet Russia was rooted in the Soviet politico-economic structure, whereas the position of environmental agencies was linked to the regulatory principle.[2] Industry's relationship with the Party and government meant that the economic units were directly involved in both policy decision and its implementation. It may be argued that the U.S. companies were similarly well placed to make the case for production prevail. During congressional hearings, industry representatives criticized the costs of pollution abatement and threatened to close their plants with consequent unemployment. The final decision was usually a product of political considerations. However, there is a difference. Interests of industry can be separated from the interests of the state. It means that governmental environmental authorities can use

state power as an instrument external to the firm to force compliance with state environmental regulations. In Soviet Russia, as previously mentioned, these two interests were merged.

Air Policy Tools

The 1980 clean air law reaffirmed a system of standardized ambient air quality norms throughout the USSR for Maximum Allowable Concentrations (MACs) based on regional environmental and industrial criteria. Emission limits were prescribed for all stationary sources and means of transportation. The law, however, upheld an incentive system of bonuses and provided for minimal flexibility by relaxing the deadlines and modifying standards to achieve compliance.

The experience of the Soviet Union with policy instruments demonstrates a merge of policy and regulatory activity. A drafting process in the Soviet Union usually started with a policy proposal by the USSR Council of Ministers approved by the Party. During the policy making stage, heads of environmental and economic agencies and managers of enterprises comprised about thirty percent of the membership on the drafting commissions. Managerial-technical personnel represented around ten percent of the delegates to the Supreme Soviet, while their ministerial superiors together with other members of the state apparatus represented around fifteen percent (Vanneman 1977; Lunev 1981). Moreover, heads and managers of enterprises and related organizations formed a substantial portion of the membership of the subcommissions of the Legislative Proposals Committee of the Supreme Soviet, which was responsible for drafting key legislation.

Soviet industrial representatives were consistent in pointing out that a drastic reduction in emissions by industries, when they were located in heavily industrialized zones, would exceed in many cases the limits of existing technology, and in others the costs of implementing projects. The solution was the so-called environmental compromise (Petrov 1980). A progressive time schedule went into effect that allowed industries in a given area to bring their point sources of emissions to the level of standards (Brinchuk 1985). These gradual or interim standards were called the Temporary Agreed-upon Emissions (TAE). This process closely resembles the U.S. experience with the Clean Air Act. Relaxation of standards and extension of deadlines always preceded or went along with the introduction of flexible methods to control air pollution.

The establishment of temporary limits required the development of a technological and socioeconomic foundation (Khachaturov 1980). First, a procedure to calculate temporary limits was set up based on the best-achieved technology among similar enterprises (Brinchuk 1985). Second, a calculation

of the costs of control compared to the benefits to the environment and society due to abatement was taken into consideration, even if pollution levels did not meet target standards. A primary function of standards was a cost-benefit calculation of the required expenses and potential results following the implementation of concrete technological measures to meet the established standards.

Moreover, the law contained an article that authorized central government and the Union republics to set up material and moral incentives for implementing its provisions (Article 21). Penalty provisions (Article 28), however, backed up this incentive scheme. Noncompliance would cause criminal, administrative, and "another liability" in accordance with USSR and Union republic legislation. Enterprises and institutions that violated the law were obligated to compensate the state for any damages caused by their noncompliance. Officials in charge had to bear direct material responsibility (Article 29).

Notwithstanding some relaxation in standards and an incentive provision, the law specified that all stationary sources of emissions had to obtain a permit from "a specially authorized state agency" (USSR LPAA 1980, Article 10). All procedures for the establishment of permit requirements had to be defined by the USSR Council of Ministers. All new and modified sources of emissions could only come into operation on agreement with the agencies exercising state supervision over air quality control. However, the law did not specify any particular methods to achieve compliance. "Enterprises, institutions, and organizations whose activities were connected to air pollution must implement organizational, economic, technological and other measures" to ensure that permit requirements are met (USSR LPAA 1980, Article 10). In this sense, the Soviet law on air quality was much less specific than the U.S. legislation, but at the same time more flexible. The law did not establish the way industry had to comply with the standards, but did establish the standards to be achieved.

The system of air quality control in the Soviet Union had an authoritative but uncoordinated character. In theory, the structure was highly centralized. In reality, the system suffered from departmentalism, duplication of functions, and dispersal of authority. The law vested the authority in a "specially authorized organ," which was usually the Council of Ministers and executive committees of regions, cities, and towns. The law itself did not provide for any specific system of incentives, but rather left the establishment of those to all-Union and republican committees and ministries. Despite a wide array of policy mechanisms envisioned by the legislation, legal and regulatory provisions reflected fundamentally an incremental policy approach.

Birth of the Russian EPA

After the passage of the Union and Russian laws on air quality, the administrative oversight over environmental protection was relatively centralized in the USSR Council of Ministers' Presidium Commission for Environmental Protection and Rational Use of Natural Resources (Astanin and Blagosklonov 1983). While this commission regularly reviewed environmental regulations and enforcement activities by the Union republic ministries and committees, it still did not represent a single environmental regulatory authority. Its powers were limited to issuing instructions on a broad array of environmental protection measures and environmental reporting (Ziegler 1987). Most of the air quality regulations found their origin in the Council of Ministers Resolution "On the Norms of Maximum Allowable Emissions of Pollutants into the Atmosphere" and the Order of the Presidium of the Supreme Soviet "On Administrative Responsibility for the Violations of the Law on Air Protection" (USSR Collection of Resolutions 1982a; 1982b; USSR Proceedings of Supreme Soviet 1982, 635).

Another problem with the implementation of air quality legislation in the Soviet Union was that out of many state agencies responsible for air quality control only the Sanitary Epidemiological Service had the authority to impose fines on violators. Yet, penalties and fines themselves were so low that they did not provide any meaningful incentive to the violators to comply with the law and regulations. Attempts to improve the functioning of the regulatory system and enhance compliance brought the notion of policy effectiveness into consideration.[3] In addition, the Resolution of the Supreme Soviet "On Compliance" identified that the system of bonuses and awards was a very weak economic mechanism to provide sufficient incentives for enterprises and organizations to protect the environment[4] (Proceedings of the USSR Supreme Soviet 1985). Accomplishing environmental goals required both measures of an institutional reorganization and a redesign of political and legal mechanisms, including provisions for incentives to abate pollution (Danilenko 1989). While bonuses and awards created an incentive structure for enterprises and individuals to improve air pollution control, they did not serve as a flexible mechanism per se. They were incentive-based supplements to the existing system of regulation.

With a new assessment of Soviet environmental policy conducted by Gorbachev's administration, a critical review of the incentive system and the work of Goskomgidromet started (Wolfson 1988; Pryde 1991). The General Secretary Mikhail Gorbachev claimed that "new ideas connected to the protection of the environment [did] not find any special support among the officials of the Committee," and "the existing system of material

incentives is complicated and ineffective" (Gorbachev 1985, 28). These inadequacies were exaggerated by inefficient enforcement, which in turn was a problem of dispersed responsibilities among multiple agencies and committees (Kolbasov 1983).

Therefore, in 1987, the government left Goskomgidromet with research responsibilities and created a new agency for environmental protection[5] (Erofeev 2003). The 1988 Joint Resolution of the CPSU Central Committee and the USSR Council of Ministers "On the Fundamental Restructuring of Environmental Protection in the Country" established an independent and comprehensive State Committee for Environmental Protection in 1988 (Goskompriroda) (USSR Collection of Resolutions 1988). Goskompriroda became an all-Union agency, with branch agencies in each of the republics. The Sanitary Epidemiological Service still retained its authority for monitoring industrial pollution, especially in air pollution cases as they related to public health (Danilenko 1989).

The structure of Goskompriroda mirrored a progressive approach to environmental protection in recognition of the fact that environmental pollution had increased in scale and complexity. This was a radical break from a traditional view of environmental problems as discrete technological issues. Goskompriroda was authorized to undertake comprehensive environmental protection measures, including promulgation of rules, norms, and regulations, monitoring, enforcement, overseeing the design, siting, and construction of industrial facilities, and issuing pollution permits, among other tasks. In particular, Goskompriroda was authorized to coordinate activities of different committees and ministries, as well as to develop new recommendations on economic instruments for environmental protection. The first major step was accumulating and publishing environmental trends data in annual reports of the state of the environment (Peterson 1993). The agency also introduced ecological *pasportizatsiya*—requiring a record (passport) of what enterprises were producing what wastes and pollutants.

GOVERNMENT AND POLICY RESTRUCTURING

The establishment of an independent environmental agency signaled an important move from a command-and-control approach to the use of various policy instruments, including market-based approaches (Brinchuk 1996). The government acknowledged that there had to be a definite switch from direct regulation to primarily economic methods of managing environmental protection activities: "The lack of effective incentives makes enterprises and organizations uninterested in providing comprehensive and rational use of natural resources and decrease in pollution of the environment" (USSR Col-

lection of Resolutions 1988). While the government lacked the appropriate financial resources needed to implement aggressive environmental strategies, a "polluter-pays" principle arose as one of the methods to help fund environmental programs. As a result, one of the Gorbachev administration's economic reform efforts was the Law on State Enterprises, which required "full compensation for the damage to the environment," and "material responsibility" for violation of environmental laws (USSR Law on State Enterprises 1987). According to then chairman of Goskompriroda, Nikolai Vorontsov: "For environmental protection to be efficient, it must become unprofitable to harm nature" (quoted in Peterson 1993, 171).

Pollution Charges

Goskompriroda and the State Committee on Economic Reform experimentally introduced pollution charges in twenty-nine subjects of the Russian Federation in the late 1980s and early 1990s (Girusov et al. 2003). Because regional or local governments were usually underfunded, they seized the opportunity to require local enterprises to pay permit fees, emission charges, and penalties (Ermakov and Sukharev 1997). The money from these fees and fines went into several funds, including local government budgets designated for environmental protection, monitoring, and pollution abatement; special public environmental funds to pay for pollution abatement equipment installed on local industries; or enterprise-managed funds earmarked for environmental protection.

Based on these experiments, a comprehensive system of pollution charges was introduced with the law "On Environmental Protection" of 1991[6] and the Regulation of the RSFSR Council of Ministers (N13, January 1991). Charges were established based on the economic damage of various pollutants, cost per unit for waste disposal, and overall revenue considerations. In total, charges were defined for 214 air pollutants and the charge system was closely connected to the system of environmental permits and enterprise-specific emission limits. Charge rates were differentiated among regions by applying coefficients established at the federal level and assumed to reflect differences in environmental situations among regions. Regional authorities received some power to adjust charge rates in response to the current environmental situation within the region.[7]

A major problem with emission charges was calculating the levels for emission fees and fines. If they are too low, they have no impact on polluters because enterprises prefer to pay charges and fines instead of assuming a costly option of cleanup. Charges and fines in the West, especially in Western Europe, are usually established to raise revenue and support regulatory bureaucracy and, as a result, may not be capable of meeting environmental

goals (Peterson 1993; Kozel'tsev 1998). Even in developed market economies and with accurate and plentiful information, it is extremely difficult to strike an appropriate and desired balance between economic development and environmental protection. This task was even more difficult for the country in transition because the levels of technological development and emissions across regions or within a given industry varied greatly.

To cope with this problem, pollution charges in Russia were integrated into the existing system of Maximum Allowable Emissions (MAEs), which were based on ambient quality standards, and Temporary Agreed-upon Emissions (TAEs), which were based on the negotiations between authorities and enterprises (Girusov et al. 2003). While temporary limits were less strict than maximum allowable ones, the aim for enterprises was to reach the latter within an agreed time period. To provide incentives for enterprises to achieve the established limits, emissions above the temporary limits were charged at a rate five times higher than the base rate. For emissions exceeding the temporary limits, a twenty-five-fold penalty would apply (R.F. Government Regulation No. 632 1992).

Polluters became responsible for preparing an emission record that was subsequently checked by environmental authorities. The law specifically provided that payment for environmental pollution did not exempt an enterprise from environmental protection measures or from paying compensation for damages caused by violations (RSFSR Law on Protection of the Environment 1991, Article 20). This new system of emission charges was essentially based on a previously established system of emission limitations and standards.

Institutional Reorganization

While a body of standard operating procedures and bureaucratic networks drove the entire policy framework, frequent revisions of environmental legislation and institutional reorganization of environmental bureaucracy haunted Russia. The Russian Federation laws have replaced the USSR legislation. The basic elements of environmental policy were formulated in the "State Strategy of the Russian Federation on Environmental Protection and Sustainable Development" (1994). Subsequent policy documents were aimed at the establishment of the National Environmental Action Plans (NEAP), with the elaboration of environmental principles.

One of the NEAP tasks was to improve environmental quality through revisions of the existing system of payments for emissions and discharges, in which a step-by-step increase of applicable charge rates up to an economically justified level was the goal (Girusov et al. 2003). Another goal was to redistribute policy authority between the federal institutions, subjects of the

Russian Federation, and local authorities, and adjust a list of pollutants and impacts to be charged. In general, federal-level committees were responsible for a regulatory direction, whereas regional offices were responsible for implementation and enforcement. As in the United States, air quality standards and norms established by federal legislation were minimum standards, and regions could independently make these rates stricter.

The State Committee on Environment (Goskompriroda) took the responsibility for the implementation of emission charges. Later, the committee's status was elevated to that of the Ministry of Environmental Protection and Natural Resources of the Russian Federation (Minpriroda)[8] (Ermakov and Sukharev 1997). This environmental ministry lasted only a short time and, in 1996, its status was changed again to the State Committee on Environmental Protection (Goskomekologiia) (R.F. Presidential Order 1996). At the same time, the Ministry of Natural Resources was established and the responsibilities for natural resource management were assigned to that ministry.

Goskomekologiia was authorized to implement and coordinate environmental policies, develop environmental policy instruments, establish and supervise environmental norms and standards, and manage the Federal Environmental Fund (Ermakov and Sukharev 1997). Goskomekologiia together with the Ministries of Economy and Finance was responsible for the setup of baseline emission rates and charges and a general level of revenues in the budget and in the extra-budget funds. At that time, Russia had a three-tier system of environmental funds that were financed through the revenues from pollution charges and provided support for environmental investments. Apart from the ten percent of the revenue that accrues to the federal budget, the revenue from the pollution charges were divided in such a way that ten percent, thirty percent, and sixty percent went to the federal, regional, and local environmental funds, respectively (Brinchuk 1996). The introduction of emission charges in Russia was due to two key goals: generation of revenue for environmental programs, that is, facilitation of governmental environmental policy implementation; and provision of incentives for enterprises and individuals to reduce negative impacts on the environment. The whole system of charges was still based on the premise that incentives should be backed by provisions for noncompliance, such as fines and a restitution of the damage to the environment. This system of emission charges received some additional incentives and flexibility. A specific form of nonmonetary settlements or exemptions from pollution charge comprised the so-called pollution charge offsets (Girusov et al. 2003). Enterprises could offset costs that form a part of an approved environmental improvement program against liable pollution charges. Such measures included participation in "regional environmental programs" and contributed to compliance with international

environmental treaties (R.F. Ministry of Environmental Protection and Natural Resources 1992; 1993). A possibility of offsetting liable payments against investments in an enterprise had a positive effect in inducing enterprises to undertake environmental investments when the alternative might have been no action and nonpayment of the charges. To make the mechanism of payments for environmental pollution even more flexible, the government decided to count expenditures of the enterprise for environmental protection measures as payments for pollution (Brinchuk 1996).

However, the system of emission charges in Russia suffered from a number of problems. First, charge rates have not kept up with inflation in full scale whereby incentives for reduction of emissions provided by the instrument have been eroded strongly (Girusov et al. 2003). Second, charges were to be calculated for over two hundred types of pollutants levied according to a complex set of rules that were previously established and hard to change. Third, many enterprises did not have adequate systems of financial control, which led to lower rates of charges even for those emission types that have established limits. Last, but not the least, constant institutional and legal reorganization within the government and an unending flow of contesting recommendations from various agencies affected the system of pollution charges.

FLEXIBILITY AND INSTABILITY OF EMISSION FEES

The new Federal Law "On Protection of the Atmospheric Air" (1999) in Russia not only reinforced old principles of air quality control through standards, permits, and inspections, but also emphasized an economic approach to air quality control through emission charges. The law, however, did not specify a mechanism by which such charges were to be established or modified (Article 28). The authority to establish charges was given to unspecified "authorized federal executive organs and executive organs of the subjects of the Russian Federation" (Article 4). This dispersion of policy authority continued to upset the development of a pollution charge system in Russia.

While in principle Goskomekologiia was in charge of air quality control, the responsibility was still fragmented among a number of agencies, with the top policy authority in the Government of the Russian Federation. The system of charges continued to operate, but its status was significantly changed in 2000. Due to the passage of the federal law, the Budget Code of the Russian Federation in January 2000, along with the introduction of the Tax Code of the Russian Federation, pollution charges became taxes (R.F. Chamber of Commerce and Industry 2004). Such a change in the use

of the instrument was only the beginning of the overall confusion in the use of incentive tools.[9]

In May 2000, Goskomekologiia was abolished as a central environmental agency and its functions were transferred into the Ministry of Natural Resources (R.F. MNR) (RF Presidential Order 2000). Russia effectively lost an independent environmental agency at the federal level. Environmental protection functions and air quality policy in particular became a mission of the State Service on Environmental Protection within the R.F. MNR. According to the chairman of the Committee on Ecology in Duma, Vladimir Grachev: "We were lucky to prove a necessity for the [Service on Environmental Protection], which is somehow separate from the resource management organs" (*Pravda* 2004). Early in 2004 the Service still carried the word "ecology" in its title and was responsible for *environmental protection* (R.F. Government Regulation 2004a). According to the May 20, 2004, Presidential Decree and the July 22, 2004, Governmental Regulation, the Service on Environmental Protection became the Federal Service for Management of Natural Resources, and a new Federal Service on Environmental, Technological, and Atomic Control was created (R.F. Government Regulation 2004b, R.F. Ministry of Natural Resources 2004).

The major responsibilities of the Federal Service on Environmental, Technological, and Atomic Control became management and enforcement of atomic and nuclear energy policies and projects, rather than the production of environmental regulations. While the State Service on Hydrometeorology was still responsible for air quality monitoring, and regional and local environmental departments conducted air quality protection activities, at the federal level resource use and management dominated over pollution prevention and protection functions. Figure 5.2 represents the organization of federal agencies participating in environmental policy design and implementation in Russia.

The system of emission charges-taxes, nevertheless, continued to operate until 2002, as Goskomekologiia promulgated them. The Ministry of Finance, the Ministry of Trade and Economic Development, and the Ministry of Natural Resources established annual coefficients for emission charges, which were further modified by regional and local authorities. However, the passage of the new Federal Law "On Protection of the Environment" in 2002 almost brought the "polluter-pays" principle to an end.

A previous law of 1991 explicitly stated that specially authorized *governmental agencies* were responsible for establishing the types and rates of pollution charges (Article 6). The new law gave this responsibility to the federal legislation (Article 16). Russia found itself not only without a single independent environmental agency to operate the pollution charge system, but also without a legal basis to charge enterprises for their emissions.

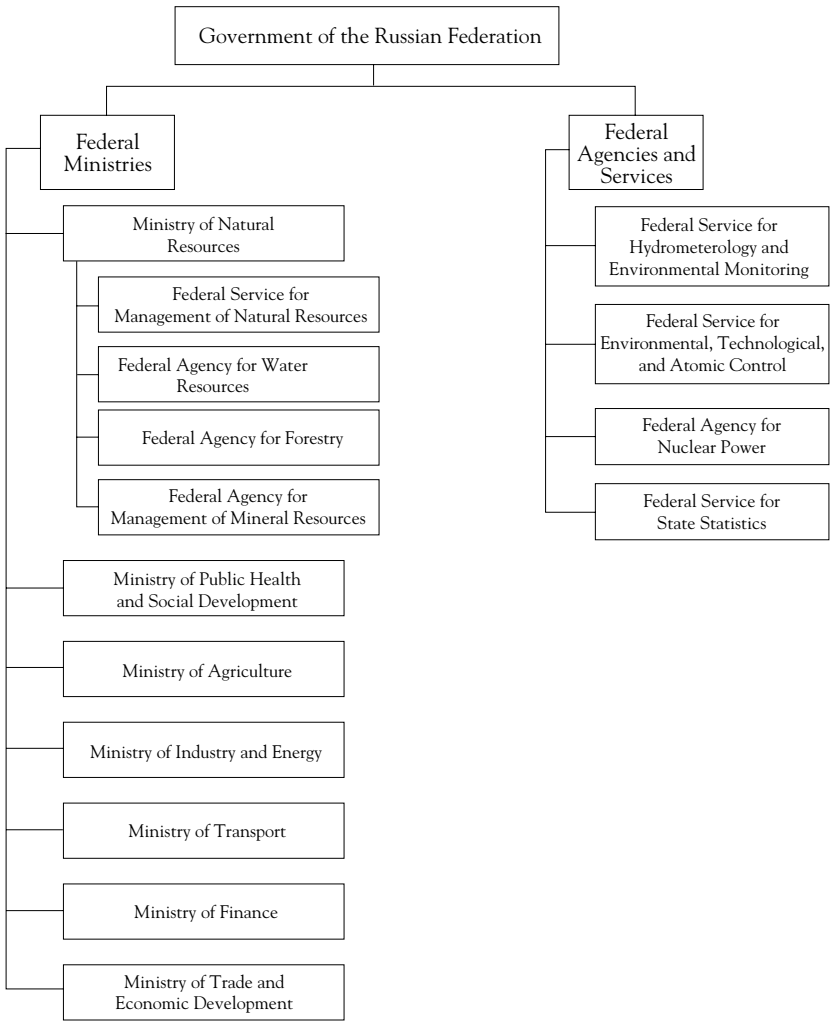

Figure 5.2 Federal Agencies with Environmental Responsibilities in Russia (2006)

The Ministry of Natural Resources continued to require payments from industry, only to find itself in the midst of a long lawsuit brought before the Supreme Court by the Kolskaia Mining-Metallurgical Company in February 2002. The Court ruled in favor of the company and found previous Governmental Decree on pollution charges (1992 N632) illegal, because the language of the new Law on Environmental Protection made

regulations produced by governmental agencies null. The court ruled that governmental regulations could not be considered a part of the legislation (March 28, No. 2002-178).

In June 2002, the Government of the Russian Federation appealed this decision in the Supreme Court. However, the Court ruled against the system of pollution charges (June 4, No. KAC 02-232). Trying to bring clarity to the situation, the Ministry of Taxes generated an explanatory letter saying that while it was still not clear what would happen to the pollution charge system, those enterprises that had already paid for polluting activities would not be reimbursed (R.F. Ministry on Taxes 2002). At the same time, the Government directed the MNR to develop a new law: On the Charges for the Negative Impacts on the Environment (R.F. Chamber of Commerce and Industry 2004). The Ministry of Natural Resources submitted a bill of the law to the Government in July 2002, and the Government challenged the decision to eliminate pollution charges in the Constitutional Court in December 2002. The Constitutional Court reinstated the system of pollution charges and, by doing so, this Court essentially equated governmental regulations to the status of the legislation (December 10, 2002, No. 284-O). The Ministry of Finance was quick to issue another letter, stating that all enterprises had to submit their payments for emissions for the entire year (R.F. Ministry of Finance 2003). The biggest policy problem was that the Constitutional Court's decision set a precedent for a mixed understanding of policy authority. Does it now mean that governmental regulations would be equal to the federal legislation in Russia? Obviously, in case of pollution charges governmental resolutions and decrees became as powerful as federal law. This precedent increased the power of governmental regulations to shape policy choices and instrument design.

Policy Design Struggles

In the midst of this confusion with the system of payments for polluting activities, the Ministry of Natural Resources (MNR) and many other governmental agencies were busy working on a new bill on pollution charges. The bill submitted to the Government of Russia by the MNR included very high rates of emission charges and almost an unlimited list of regulated pollutants (R.F. Bill of the Law on Charges 2002). The Ministry of Finance made its comments on the allocation of money collected from payments and strongly opposed the requirement that fifty percent of the money would go to local budgets.

Other comments to the MNR and the Government on the bill came from the Ministry of Trade and Economic Development. The ministry emphasized that the list of pollutants had to be shortened[10] and that payments

for emissions above standards should not be regulated by the new law, but rather by the Code of Administrative Violations. The ministry tried to further disperse policy authority of the charge system, which bears a close similarity with the Soviet system of environmental management, in which multiple laws and agencies were dealing with the same issue, thus producing a duplication of functions and ineffective policies. The legacy of the Soviet system continued to play an important role in the development of environmental legislation in Russia. While the bill on pollution charges should be introduced in the legislature and all interested agencies should comment on it, presently the system favors a protracted deliberation of a bill by all interested ministries, approval of the Government, and then a legislative action.

The deputy of the State Duma, chairman of the Committee on Ecology, V. A. Grachev, in fact introduced an alternative Bill on the Charges (No. 216152-3), which Duma deliberated twice and then submitted to the Government for consideration. Another deputy, G. V. Kulik introduced a new amendment to the Tax Code on Environmental Taxes. However, the Government declined both the bill on charges and the tax amendment.

The Chamber of Commerce and Industry together with the representatives of industry proposed their changes to the bill. These mostly included a reduction in fines for emissions beyond standards and a reconsideration of the coefficients for charges with regard to ecological features of a given area. However, the most important part of their alternative was the introduction of flexibility into the pollution charge system. Their intent was to replace a fiscal character of payments with a compensational and incentive-based character (R.F. Chamber of Commerce and Industry 2002). Industry itself referred to that approach as "compulsory investments" (NSPI 2004). The main goal of this approach was to redirect at least a portion of pollution payments from state budgets to enterprises in order to install new technologies and implement new environmental programs. This so-called variation of the refunded emission payments—a two-part instrument—had an incentive for enterprises to introduce cleaner technology.

The Ministry of Natural Resources took some suggestions on the bill into consideration. Emission payments would be considered as charges and not taxes, the list of air pollutants to calculate charges would be still above two hundred, but charge rates would be decreased three times (R. F. Bill of the Law on the Charges 2002). However, the bill still carried quite a fiscal character—to raise revenue and collect as much money as possible from polluting enterprises.

While at this stage of environmental policy development in Russia an incentive approach seemed most rational, it still contradicted a determination, specifically stated in law, that polluters were responsible for the

damage to the environment, and that payments for emissions did not free an enterprise from installing necessary equipment. Giving more flexibility to industry in dealing with charges could form a part of an evolutionary approach to a more effective and flexible environmental policy. Prioritizing pollutants with regard to charges and moving away from strict standards, on which all the standards and limits were based, could ensure a proper balance between environmental and economic goals that the government tries to pursue.

In 2004, the Bill of the Law on Charges was still under consideration by all interested ministries. While the MNR stood strongly on its position to require payments for emissions within the allowable limits and refund money only to the enterprises whose emissions were within the established standards, industry strongly opposed the bill. The main advantage of a refunded emission scheme related to the distribution of costs and thus the political economy of the instrument. Because some firms could return their money, or pay less, this could theoretically create less resistance to the instrument. However, Russian industry representatives were very skeptical that enterprises would receive parts of their payments back because "practically all enterprises have some emissions beyond the limits at a certain point" (Arkhipov, quoted in *Vedomosti* 2003). Moreover, in an attempt to defend a concept of ecologically clean enterprises, industry argued that a fiscal character of the proposed charge system would "dissolve" the money from payments in a state budget instead of using it for specific abatement projects.

The Bill of the Law on Charges for the Negative Impacts on the Environment was considered in the Government of Russia in November 2004 and in the State Duma in December 2004. As of 2006, the bill did not become law. During the September hearings, the State Duma Committee on Ecology called on the Government for more active and responsible environmental regulation in the country. Specifically, the committee urged the passage of the Law on Charges for the Negative Impacts on the Environment, the adoption of the Environmental Code, clarification of policy authority among federal agencies and subnational governmental bodies, and, most important, the creation of an independent, centralized and separate agency for environmental protection at the federal level. In March 2008, after a series of sessions and hearings, the upper chamber of the Russian parliament—the Federation Council—also pushed for the passage of the law on Charges, the law on Environmental Insurance, and the establishment of an independent federal executive agency for environmental protection. Should the wishes of the legislative committees come true, Russian environmental policy may develop better flexible economic instruments for environmental protection in the country.

CONCLUSIONS: INSTITUTIONAL LEGACIES AND POLICY CHANGE

A decrease in emissions in Russia was a result of the efforts initiated by the Soviet government in the early 1970s to improve urban air quality. The declared principles of air quality control were based on health considerations, a complex and comprehensive approach toward environmental protection, and a principle of strict compliance with the law. While these declared principles were not always realized in practice, they still drove the system of air protection and dictated conditions of policy instruments adoption. Very strict standards of air quality were the result of an emphasis on the health of the population and a long history of prominence of sanitary-hygienic standards and regulations.

The main instruments of air quality protection in Russia remain based on standards and qualified prohibitions. Nevertheless, a rather sophisticated scheme of emission charges was developed. The challenge of coping with environmental degradation stimulated a reevaluation of certain basic assumptions about the methods to achieve superior environmental results, and found a reflection in official governmental policies. Yet the development of air quality policy explicitly demonstrates a continuing influence of the traditional regulatory structure on the introduction of flexible instruments. Environmental policy instruments have been and are established by the enormous number of federal laws and governmental regulations, produced by multiple federal organs, regional environmental protection agencies, and local authorities. In principle, the contemporary administrative structure represents a modern version of policy relationships found in Soviet Russia, where environmental policy authority was dispersed among a number of agencies with a duplication of functions, and resource use agencies dominated the agenda. This problem of departmentalism, in which various ministries and institutes at the expense of the general welfare pursue narrow and segmental interests, frustrates new solutions to environmental problems. Protracted battles over the design and implementation of a pollution charge system can be attributed to the lack of coordination from an independent authority providing for guidance and consistency in the adoption of new policy approaches.

In contrast to the U.S. experience, in the Soviet Union, as well as in contemporary Russia, the introduction of incentives has usually been a joint effort of a policy making body and a number of administrative agencies. During Soviet times, the Party and the Council of Ministers decisions promulgated moral and material incentive schemes. The experimentation with the system of pollution charges was the initiative of an administrative agency—the State Committee on Economic Reform—with the help of the State Committee on Environment. However, their contribution to the development of the

emission charge system was mostly prominent only after the passage of the law authoring a "polluter-pays" principle. Moreover, contemporary struggles over the charge system involve the State Duma, multiple ministries, and the Government, where the latter usually plays a leading role.

It is notable, though, that the type of an established regulatory framework or a system of standards determined the fate of incentive-based tools in air quality policy. Emission charge rates are calculated based on the existing limitations of air pollution, and fees are indexed to reflect the level of compliance. Furthermore, the complexity of applying existing flexible approaches demonstrates the complexity of a previous regulatory scheme. It is an enormous list of regulated pollutants and the strictness of pollution norms that hold back expected improvements in the emission charge system. In addition, post-Soviet Russia has inherited a very complex institutional infrastructure of organizations, laws, regulations, norms, and procedures. This dense network of institutions persists and influences the adoption of new strategies. It might therefore be wise to start by implementing some less complex regulation alternatives and to learn from these experiences.

Similar to the U.S. practice, the system of emission charges is combined with direct regulation provisions for noncompliance penalties and compensation for damage to the environment. Moreover, the elaborated system of pollution permits forces unlicensed enterprises to pay higher fees. The implementation of this mechanism is aimed at achieving better compliance results by enterprises. Finally, in the Russian system of emission charges, the goals of multiple administrative agencies are, unfortunately, not only to protect the environment, but also to increase revenue collection. The elimination of the environmental funds system and the uncertain future of funds collected from emission fees do not work in full support of the assumption that flexible instruments are introduced to help government clear up the skies.

The case of air quality policy in Russia raises many other significant questions with regard to the location and nature of environmental policy authority, the relationships between policy making and regulatory organs, between the government and the regulated, and policy processes in general. First, a multiplicity of interests—including an array of administrative agencies and economic interests—always involved in the formation and implementation of environmental policy in Soviet and post-Soviet Russia pose risks of diverting the initial goals of policy to satisfy diverse demands. In the case of environmental protection policy, the lack of a strong and independent environmental agency contributes to the asymmetry of power between the interests. This in turn may lead to the problems of regulatory dependence and capture. Thus, in countries with dispersed policy authority, establishing rule-based flexible instruments may prevent negative implications of discretionary power.

Second, the Russian air quality case demonstrates an incremental character of policy development, which makes it similar in this regard to the U.S. experience. Both countries adhered to the analogous regulatory principle: direct regulation with an incremental inclusion of flexibility and incentives in regulatory policy. The pluralist nature of American policy process sometimes restricted the options for policy instruments, when political pressures from industrial and environmental groups forced the adoption of incremental approaches. In Russia, many constraints on the policy process were imposed by industry, but, most important, by the "pluralistic" nature of multiple governmental bodies designing policy responses to air pollution problems.

Third, a substantial influence of institutional and political factors on policy process and choices, especially with regard to instrumental innovation, cannot be underestimated. Continuity with legal arrangements, regulatory culture, and patterns of institutional establishments affect the probability that a particular policy tool will be adopted. The starting points of the present regulatory framework tend to govern the reforms that might be feasible in the future.

Finally, this case draws our attention to larger issues of policy continuity and change, which are crucial for understanding governmental actions within the governance paradigm. Establishing enduring innovations in public policy that will lead to better policy performance depends on both elements of continuity and change. The process of policy change to achieve greater effectiveness, efficiency, and legitimacy is usually influenced by a number of factors. The first condition is policy system readiness for change, followed by the implementation whereby change is introduced in the policy system. The final step is the institutionalization of change whereby the policy system is stabilized in its changed state. These stages of change adoption, implementation, and institutionalization are usually interwoven through the cycle of innovation. However, if innovation is not institutionalized, it is likely it will be terminated. A question of whether an innovation will be mastered and whether it will change the policy landscape is very similar to the issue of the likelihood that the innovation will be continued. This points to the fact that any successful change requires an element of continuity and that successful innovation is a necessary antecedent to institutionalization. A successful policy change can also serve as a catalyst for subsequent innovations. While policy changes are inevitable, the degree and success of change strongly depend on the endurance of already established policy practices. If traditional policy institutions are static and resistant to change, the prospects of innovations to improve policy performance would strongly depend on continuous adjustments to improve policy performance.

CHAPTER 6

Incentives and Revenue

Russian Water Quality Policy

Water quality policy in Russia is very similar to clean air policy in its design and implementation. During the Soviet era, air and water resources were under the state control, and were not considered as goods and services. Consequently, these resources could not be monetarily assessed, bought, or sold. From a political standpoint and the probability of use of "sticks" and "carrots," clean air and water policies became regulatory in nature. Water quality policy formed a system of health-based standards, from which pollution limits were calculated, and pollution charges were established later.

A system of effluent charges forms a part of the overall scheme of pollution charges and the basic principles for these charges and noncompliance fees are the same as those for emission charges. Yet the employment of flexible instruments is impeded by conflicting jurisdictions between different levels of power. The lack of an independent environmental policy authority in both air and water quality policy, a burdensome complexity of the established command-and-control mechanisms, and deficiencies in the institutions and culture of markets are prominent factors that influence the use of flexible instruments. The incentive function of flexible tools is overshadowed by the need to raise revenue for governmental environmental programs. However, as in the United States, economic instruments in Russia are based on existing regulations. The complexities of regulations along with strict standards make the introduction and sustenance of flexible tools a more difficult task. Table 6.1 summarizes the development of water quality policies and instruments in the Soviet Union and Russia.

This chapter moves through four stages explaining the evolution of water laws, policies, and regulations in Soviet and post-Soviet Russia. It starts

Table 6.1 Development of Water Quality Control Laws and Regulations in the Soviet Union and Russia

Year	*Legislative / Regulatory Activity*
1948	The USSR Ministry of Health establishes first water quality standards—Maximum Allowable Concentrations (MACs)
1960	RSFSR Law on Protection of Nature requires all organizations that have an effect on water bodies to build purification facilities, and prohibits the operation of new enterprises, which will not ensure sewage treatment
1963	The USSR Council of Ministers passes the resolution: On Establishment of Penalties for Violations of the Rules of Protection and Use of Water Resources
1970	Principles of Water Legislation establish the system of direct regulation of water quality
1972	The CPSU Central Committee and the USSR Council of Ministries pass a Joint Resolution to Strengthen Environmental Protection and Rational Development of Natural Resources
1974	Incorporation of environmental protection into the state plan and provision of governmental subsidies to enterprises Creation of environmental sections in state committees and enterprises Ministry of Reclamation and Water Resources, the Ministry of Health, and the Ministry of Fishing adopt new regulations for surface water quality
1978	Joint Resolution of the Party Central Committee and the Council of Ministers On Additional Strengthening of Environmental Protection and the Rational Development of Natural Resources An incentive system of bonuses and awards for enterprises and workers are made contingent on enterprise's fulfillment of its plan
1981	Establishment of standards (MACs) for about 420 pollutants drinking or other water designated for human use, for 68 pollutants in waters designated for fish or other wildlife, and for 247 inorganic substances
1982	The USSR Council of Ministers Resolution of January 8, 1982, designates new norms for the Maximum Allowable Concentrations of pollutants into surface waters

Year	*Legislative / Regulatory Activity*
1988	Joint Resolution of the CPSU Central Committee and the USSR Council of Ministers On the Fundamental Restructuring of Environmental Protection in the Country
	Establishment of an independent and centralized organ for pollution control—State Committee for Environmental Protection (Goskompriroda)
	Experiment with pollution charge system in the twenty-nine regions
1991	Law "On Environmental Protection" and the Regulation of the RSFSR Council of Ministers establishes the system of pollution charges
1992	R.F. Governmental Regulation On Establishment and Calculation of the Chargers for Environmental Pollution, Disposal of Wastes, and Other Negative Impacts
	Introduction of nonmonetary settlements or exemption from pollution charges—pollution charges offsets
1994	Goskompriroda elevated to the status of the Ministry of Environmental Protection and Natural Resources of the Russian Federation
1995	R.F. Water Code establishes main principles of the economic approach: charges for water use and pollution, governmental financing for water protection, and economic incentives for water quality protection—system of tax credits and waivers
1996	The Ministry of Environmental Protection and Natural Resources is reorganized into the State Committee on Environment (Goskomekologiia)
1998	Law On the Charges to Use Water Objects reinforces effluent charge provisions
	Ministry of Natural Resources and Goskomekologiia promulgate regulations for the establishment, calculation, and enforcement of the effluent charge system
	Goskomekologiia experiments with environmental audit and liability approaches
2000	Goskomekologiia is abolished as a central environmental agency and its functions are transferred into the Ministry of Natural Resources (RF MNR)

continued on next page

Table 6.1 *Continued*

Year	*Legislative/Regulatory Activity*
2002	Federal Law On Protection of the Environment reinforces the polluter pays principle, but does not establish the mechanism for calculating and imposing charges
	Lawsuit on the legality of charges brought by industry
	Supreme Court abolishes the pollution charge system
	Constitutional Court reestablishes the system of pollution charges
	Introduction of the Bill of the Law on Charges for the Negative Impact on the Environment
	Introduction of the refunded emission payments scheme
2004	Law on Charges for the Negative Impact on the Environment is scheduled to be considered in the State Duma and Government of Russia
2006	Adoption of the new Water Code

with an historical perspective on government involvement in water pollution control. An analysis of the adoption of the Principles of Water Legislation of 1970, the law that guided water policies in the Soviet Union, follows to demonstrate the scale of a national response to water pollution problems. An exploration into the structure of environmental policy authority, regulatory methods, and early incentive schemes explains the factors that influenced federal regulations in Soviet Russia. Third, policy changes during the turbulent times of institutional restructuring throughout and after the collapse of the Soviet Union reveal the development of policy in the legislative arena with the introduction of the Water Code, which authorized a system of effluent charges. Fourth, the chapter moves to expose current policy battles over the system of pollution charges and other various incentive-based instruments. A conclusion emphasizes that an always changing regulatory framework and a strong reliance on previously established regulatory practices present significant difficulties for the application of flexible instruments.

EARLY WATER QUALITY POLICY

Increased public health hazards, economic losses from massive fish kills, and unsuitability of polluted water for industrial purposes in the Soviet Union prompted basic legislation governing water quality control. In 1963, the USSR Council of Ministers adopted a significant resolution: "On Establishment of Penalties for Violations of the Rules of Protection and Use of Water

Resources." However, early water quality policy in the Soviet Union, similar to the U.S. experience, was mostly characterized by local control over nearly all stages of enforcement and inefficiency of imposed fines (Clawson and Kolarik 1978). Soviet health experts were strong in the areas of occupational diseases and epidemiology: "During the war we had adopted probably the most rigorous standards in the world for drinking water . . . we sat at international tables . . . we were mentors, teachers" (quoted in Komarov 1978, 65). Water quality standards—Maximum Allowable Concentrations (MACs) for water pollutants—existed since the 1940s and the Ministry of Health's State Sanitary Inspectorate adopted Maximum Allowable Discharges (MADs) into water bodies in the mid-1950s. These standards reflected human health factors and were extremely strict, which made them almost impossible to comply with (Riazanov 1960).

The Russian Law on Protection of Nature (1960) required all organizations that had an effect on water bodies to build purification facilities, and prohibited putting new enterprises into operation that would not ensure sewage treatment (RSFSR Law on Protection of Nature 1960, Article 3). However, the law did not specify exact measures, or dates, for the installation of treatment facilities, nor was it clear about the distribution of policy authority or liability upon noncompliance. Moreover, while the Russian law provided for a planning procedure describing use and protection of water resources (Article 14), planning was centralized at the Union level with no provision for environmental planning. This resulted in an almost complete nullification of environmental planning at the republic's level and consequent delays in implementation.

Under these circumstances, the scientific community, nature protection societies, and even economic-occupational interests expressed a strong dissatisfaction with the existing policy. Their main concerns were the outdated and ineffective resolutions and lax enforcement (*Izvestiia* 1967; Clawson and Kolarik 1978). As a result, the government started progressively elevating water pollution concerns to the Union level by singling out individual water quality problems. In 1965, the Lake Baikal Basin was designated for an extraordinary action, and, in 1969, the USSR Council of Ministers declared the basin a protected zone (USSR Council of Ministers 1969). Baikal's problems elevated water quality policy status to the institutional agenda and prompted a more active attention at the federal level.

COMMAND AND CONTROL PRINCIPLES OF WATER QUALITY POLICY

On December 10, 1970, a national law, the Principles of Water Legislation (PWL), established a general list of water policy requirements and

prohibitions, but left the details to the USSR Council of Ministers, individual republics, and local agencies.[1] In contrast to the U.S. Water Quality Act, Soviet law did not mark a radical change in the approach and philosophy to water pollution control. While in both countries, water quality legislation was command-and-control oriented, in Russia, policy attention to water quality did not result in a concentration of policy authority to provide for policy consistency.

The formulation of the Principles illustrated a large number of participants in water quality policy. A substantial amount of work to prepare a draft of the legislation involved representatives of interested ministries, research institutions, and experts in the area of water management (Donaldson 1972; Kramer 1978). Soliciting views from multiple ministries was crucial to avoid an amendment later. A rough draft of the Principles of Water Legislation was sent out to some 130 different institutions for comment, where heads of ministries and managers of enterprises composed thirty-one percent of the membership of the drafting commission (Jancar 1987). However, the welter of different levels of authority and a declarative nature of legal provisions amounted to delays in passing and implementing the law.

Instruments of Control

The Principles of Water Legislation had admirable goals, including a zero-discharge provision. "Soviet water legislation is called upon actively to facilitate most effective and scientifically substantiated utilization of water and its protection against pollution, obstruction and depletion," as well as "take steps for a complete cessation of the discharge . . . of sewage containing pollutants" (USSR PWL 1970, Articles 1, 17). These similarities in legislative declarations of the United States and Soviet Union are striking. The Principles required establishing all-Union standards for water quality, methods for evaluating water quality, and establishing a system of a unified record keeping. Union republics were authorized to administer water quality control and enforcement. Discharges could only be authorized through a system of permits issued by the USSR Council of Ministers, republican ministers, or local state agencies (USSR PWL 1970, Articles 5, 14, 15, and 31).

A major difference between the U.S. and Soviet water quality legislation in the 1970s was that the former was technology forcing, with discharge limits based on technology requirements. The latter was a mix of health-based water quality standards and technology specifications. Discharges were permitted only in cases in which they did not lead to an increase in a pollutant content of a particular body of water above the established norms. According to Article 10 of the Principles, all organizations had to install treatment facilities, and no new and modified enterprises could operate

without "devices to prevent water pollution" (USSR PWL 1970, Article 10). Moreover, while the U.S. law specifically established the date-certain principle, Soviet legislation left all planning procedures to "agencies for regulation, utilization and conservation of water" at the national, republican, and local levels (USSR PWL 1970).

Most new technology proposals came out of the USSR Academy of Sciences. However, the system of planning indices in most cases gave no incentive to an enterprise to adopt new technology notwithstanding its technical or environmental merits (Komarov 1978). In 1974, the Ministry of Melioration and Water Resources, the Ministry of Health, and the Ministry of Fish Industry adopted new regulations for surface water quality. Specifically, they categorically prohibited a start-up of any enterprise that would discharge pollutants of unknown toxicity, that is, those for which health experts had not yet set the standards. Since then, plans for industries that would discharge new, unknown substances had not been approved. However, as long as industry continued to develop through the synthesis of new substances, plants continued to be built to produce them, since health experts could not publish hundreds of new standards without delay (Komarov 1978).

Analogous to the U.S. Water Quality Act, the 1970 Principles of Water Legislation provided for financial assistance to enterprises, but not for flexibility in water quality control. Governmental subsidies for wastewater treatment facilities in 1975 amounted to 1.8 billion rubles (USSR Proceedings of the Supreme Soviet 1974, 883). The Principles required "technological, forest-amelioration, agrotechnical, sanitary and other measures to ensure the protection of water from pollution," but did not incorporate any incentive schemes (USSR PWL 1970, Article 37). In essence, the law made water use free of charge in most cases to state, cooperative, and public organizations, enterprises, and citizens (USSR PWL, Article 15, 1970). This omission of payments requirement for wastewater discharge from main national legislation not only eliminated the incentive to reduce pollution, but also distorted many operating decisions at lower levels. Even when enterprises were supposed to include treatment facilities in a plant, management could bypass them to save current operating costs (Campbell 1978). Practically no attention was given to efficiency implications of pricing and taxation, and accordingly these had very little effect on economic outcomes.

A number of academics often tried to persuade government agencies to abandon the idea of "cost-free" water (Loiter 1967). They argued that the lack of a price for water does not promote a prudent attitude toward it (Lemeshev 1975). Despite the difficulty of assigning responsibility to each enterprise for its precise social costs, the scholars insisted that it would be in the interest of the USSR to make each enterprise pay for the social costs it generated, where much pollution could be treated within the confines of a

plant before it could be pushed onto the population as a whole (Goldman 1972). In doing so, experts cited the experience of socialist Czechoslovakia. However, at the level of the Central Committee of the CPSU, they received an abrupt "no," since an economic approach would contradict the principles of a socialist economy, in which costs were determined only by social labor invested, and no one had invested labor in water bodies (Komarov 1978).

As a true legislation based on direct regulation, the Principles of Water Legislation *obligated* all users to protect water quality. Noncompliance was punishable by civil and criminal penalties, but the liability was not directly established by law. The funds to pay fines were frequently already included in financial plans of the enterprises, rather than taken directly from the plant directors' pockets (Armand 1966). Moreover, water quality violations were governed by different levels of government and codes, including the Code on Administrative Violations and the Criminal Code. Such a command-and-control character of Soviet water policy was shallow on the control part of the provisions: "The law misses the fundamental: sanctions are absent; the law functions as a declarative document of moral character" (Muntian 1973, 138). This increased the potential for violations and a difficulty of coordination between environmental law and administrative and criminal codes.

Fragmentation of Policy Authority

The administration of water quality laws was vested in the USSR Council of Ministers, Union republics, councils, and a number of other agencies at the national and regional levels. Table 6.2 demonstrates a dispersal of water quality regulatory authority in the Soviet Union. Since 1978, however, the State Committee on Hydrometeorology and the Environment (Goskomgidromet) had increasingly assumed the role of a Soviet Environmental Protection Agency. Goskomgidromet conducted biochemical studies of surface waters at 4,000 points on over 1,000 bodies of water (Izrael 1979).

Nonetheless, Goskomgidromet remained a primary agency for air pollution monitoring, and the legal responsibility for water pollution control rested largely with the Sanitary Epidemiological Service of the Ministry of Health. The Ministry of Melioration and Water Resources (Minvodkhoz), the Ministry of Agriculture, the Ministry of Fish Industry, and others further shared this responsibility. Fragmentation was most prominent in the area of expertise, where twenty-six different institutions were authorized to analyze and promote water quality policy. The territorial organization of environmental policy authority further fragmented jurisdictional authority. In such cases, a territorial subdivision of a central ministry did not necessarily manage a corresponding regional area.

Table 6.2 Distribution of Functional Responsibilities for Water Quality Policy among Governmental Agencies in the Soviet Union

Functional Responsibility	*Governmental Agency*
Research and Planning	State Planning Committee
	State Committee on Construction
	State Committee on Science and Technology
	State Committee on Hydrometeorology
	State Committee on Forests
	State Agro-Industrial Committee
	Ministry of Health
	Ministry of Melioration and Water Resources
Utilization	State Committee on Construction
	State Committee on Hydrometeorology
	State Agro-Industrial Committee
	Ministry of Justice
	Ministry of Health
	Ministry of Oil Refining and Petrochemical Industry
	Ministry of Chemical and Petroleum Machine Building
	Ministry of Coal
	Ministry of Fish Industry
	Ministry of Timber, Pulp and Paper Industry
	Ministry of Melioration and Water Resources
Enforcement and Control	State Committee on Construction
	State Committee on Hydrometeorology
	State Agro-Industrial Committee
	Ministry of Justice
	Ministry of Health
	Ministry of Chemical and Petroleum Machine Building
	Ministry of Coal
	Ministry of Fish Industry
Expertise	State Committee on Construction
	State Committee on Science and Technology
	State Committee on Hydrometeorology
	State Committee on Forests
	Ministry of Health
	Ministry of Oil Refining and Petrochemical Industry
	Ministry of Timber, Pulp and Paper Industry
	Ministry of Melioration and Water Resources
	Academy of Sciences

Sources: V. V. Petrov. *Pravovaia okhrana prirody v SSSR* (Legal protection of nature in the USSR). Moscow: Iuridicheskaia Literatura, 1984.

For example, river basin administrations that managed interrepublican waterways or waters of national and international significance, such as Lake Baikal, were directly subordinate to the USSR Minvodkhoz. Administrations of river basins located within the borders of one republic were indirectly responsible to the USSR Minvodkhoz through the republican ministry. However, Russian river basin administrations were subordinated to different departments, including Minvodkhoz in different matters (Kolbasov 1976). Such a system was not beneficial for policy consistency and coordination. Neither local environmental agencies nor industrial enterprises could come to any agreement independently of the central bureaucracies, where decision-making was thrown back to Moscow. Thus, major constraints on Soviet environmental authorities came from the splintering of administrative responsibility into multiple overlapping segments, setting the environmental agencies at a disadvantage against the monopoly power of central economic ministries.

In short, efforts of Soviet policy and decision-makers to manage and protect water resources included a codification of the legal system of water management, establishment of new administrative agencies, and a system of river basin inspectorates. The gradual increase in legislation relating to water pollution abatement was due to the recognition of economic effects of water pollution on economic growth. As well as in the United States, a clear trend was established away from local and regional authority toward central policy making on water pollution problems. However, in contrast to the United States, the administrative apparatus for water quality management and control at the national level, as well as for air quality control, was weak and dispersed among multiple agencies in the USSR. There was a slow trend toward establishing an integrated machinery with the emergence of the Ministry of Melioration and Water Resources, the Scientific Research Institute for Water Problems, and the Department of Water Resources in the State Planning Committee. Nevertheless, water quality regulatory authority was still very fragmented and weak in comparison to production and economic ministries. Last but not least, water law was much more concerned with principles rather than with procedures and instruments.

INSTITUTIONAL CONSTRAINTS

Serious institutional and organizational problems found in water quality policy affected a choice of means to implement and enforce water policy provisions. Both ministerial and factory managers strove to achieve production quotas. Rigid plan criteria and burdensome complexity of water quality standards impeded the development of innovative and incentive-based

policy approaches. Any reordering of priorities in favor of the environment involved restructuring of the ministerial pecking order (Kelley et al. 1976). Insufficient synchronization and attention to policy tools required greater coordination, supervision, and incentives to overcome delays in installing treatment facilities and controlling water pollution.

Hurdles of Ministerial Hierarchy

Direct regulation comes as a response to many externalities of production processes as well as necessity for making polluters more responsible for negative externalities. Coercive power of the state materializes in legal norms and regulatory provisions. However, these instruments are not applied effectively if the power of the state—regulation and control of water pollution—is not clearly separated from economic and production interests. Exactly because of this fact, there is a need for a separate environmental control agency.

In Russia, discussions about a single independent agency for environmental protection at the federal level continued for many years. The then director of the Institute of Water Problems, V. Kunin, wrote that "nine out of ten serious problems with water pollution in the USSR were administrative and organizational, rather than scientific" (quoted in Komarov 1978). Fragmentation of environmental policy authority and weakness of agencies with environmental responsibilities, comparative to the resource exploitation ministries, impeded the development of comprehensive and innovative approaches. Early considerations by the Supreme Soviet to create a national environmental agency did not receive any further development (USSR Proceedings of the Supreme Soviet 1972, 54, 85, 110). Some republics, not including Russia, established State Committees on Environment within their respective Councils of Ministers. Many of the republics still did not have a separate organ for environmental administration ten republics had subordinate Ministries of Melioration to control water pollution; however, in four different republics, these ministries administered utilization of water resources, but did not control water pollution.

This combination of utilization and control functions was usually referred to as *rationalistic* use of natural resources and dispersion of authority was attributed to the specifics of geoecological elements within the republics (Kolbasov 1976). This duplication of environmental functions and the overwhelming powers of production interests impeded the achievement of environmental goals. Such administrative organization could only have been justified if there was an appropriate level of coordination and subordination among them. In practice, such coordination did not exist, and activities of republican agencies were not systematized or comparatively analyzed. As a result, there was a lack of a unified governmental policy to ensure

implementation of the legislative provisions including modest provisions for water effluent charges, let alone development of more innovative flexible approaches.

Implementation of Water Quality Standards

Types of established controls significantly influenced the direction and instruments of water quality policy. Maximum Allowable Concentrations (MACs) for water pollutants and discharge limitations based on them were numerous and complex. In 1981, there were nationally approved MACs for about 420 pollutants found in drinking or other waters designated for human use, for 68 pollutants in waters designated for fish or other wildlife, and for 247 inorganic substances (Kirpatovskii 1980). The complexity of applying water quality standards stemmed not only from their long list and strictness, but also from the administration of such standards. The USSR Council of Ministers Resolution of January 8, 1982, designated that new MACs were to be drawn up by the State Committee on Construction and other interested agencies, and approved by the State Committee on Hydrometeorology (Goskomgidromet) and the USSR Ministry of Health (USSR Proceedings of Supreme Soviet 1982).

As water policy developed, scientific institutions could not keep up with the study of all new water pollutants that went into the rivers and lakes. The determination of a standard for just one substance took about eighteen months and cost 50,000 rubles. Industry was developing much more rapidly than the standards for environmental quality (Komarov 1978). New scientific bureaus emerged slowly, and they appeared mainly in various ministries that performed production functions. To partially cope with the problem, planners closed, relocated, or modified many enterprises, especially in major political and cultural centers, such as Moscow. During early 1970s, three hundred industrial enterprises were removed from Moscow (RSFSR Executive Committee of the Moscow City Council of Workers 1973).

Standardization process also influenced fulfillment of environmental criteria by creating rigid and task-oriented formulas and handing them down through the ministerial hierarchy to enterprises for environmental plan proposals. In 1976, the State Standard Committee established a System of Standards in the Sphere of Nature Protection and Improvement of Utilization of Natural Resources, including specific articles devoted to water quality protection (USSR State Standard Committee 1977). A factory developing a plan to control water pollution had to give an account of 420 pollutants listed in "The General Requirements for the Composition and Water Properties of Water Objects at Points of Economic, Drinking and Cultural-residential Water Use" (Sharikov 1978). Industrial enterprises

had to identify the level of actual pollution for each pollutant, a projected level of pollution at the end of a plan period, and a summary of measures to be undertaken to meet this projection.

Such a complicated system of administration inhibited the development of any alternative methods of regulation. The cycle of the application of standards—development-approval-implementation—as well as compliance monitoring, undertaken simultaneously by multiple agencies, did not leave much energy for experimentation. Attention to water problems, however, fueled by a growing demand for water and awareness that water could not be considered as a free good, prompted a larger response by government in the form of subsidies to industrial and municipal facilities (Campbell 1978). As in the United States, water pollution control in the Soviet Union received much more federal money than air pollution. For the years of 1976–1980, roughly seventy-seven percent of the USSR environmental investment was allocated to control water pollution, and only nine percent to air pollution control. In Russia, the investments were similarly divided (RSFSR in Figures 1979; Statistical Collection 1980). During the eleventh five-year plan (1981–1985), 8.1 billion rubles was designated to control water pollution, which included building wastewater facilities. Similarly to the United States, a significant emphasis was placed on constructing municipal wastewater treatment plants through government-provided subsidies. However, subsidies, while providing some incentive to cut pollution, cannot be considered as a flexible tool per se. The unavailability of other inducements and a mere provision of subsidies would not cause a polluter to reduce its discharges. Subsidies do not provide disincentives to exploit common-property resources.

To improve the process of water policy implementation and increase compliance with the strictest standards, Soviet policy makers introduced some incentive-based approaches. Soviet experience, however, demonstrates that direct regulation and incentive-based approaches at that time were declarative and oriented toward ensuring compliance mainly through raising moral standards and appealing to the consciousness and merits of socialistic competition, rather than developing sophisticated flexible schemes or economic instruments.

Incentives to Protect Water Quality

Soviet scholars considered two types of incentive policies: pure incentives, or positive reinforcement of an activity; and disincentives, or taking away material possessions and imposing administrative, civil, material, or criminal responsibility (Torgan 1983; Danilenko 1989). By imposing administrative responsibility for violations of water quality laws and regulations and providing bonuses and rewards for rational use of water resources, the government

supplied (dis)incentives since both methods were directed toward achieving environmental goals (RSFSR Water Code 1972).

A practice of using incentive and disincentive mechanisms in water quality policy in the Soviet Union emerged rather early, but it was significantly overshadowed by a traditional command-and-control approach. In the 1960s, a number of governmental resolutions dealing with incentive policies appeared: a Resolution of the USSR Council of Ministers "On the Measures to Improve Usage and Increase Protection of Water Resources in the USSR" (1966) and a Resolution of the State Committee on Labor "On the Order of Withholding Awards in Cases of Failure to Undertake Measures to Protect Water Quality in a Timely Manner" (1967). These resolutions proposed direct regulation and incentive-based mechanisms to control water pollution based on the consideration of health risks. Epidemic diseases, which were frequent especially in the postwar period, prompted prudent attitude to water and a public awareness of the problem.

One of the distinguishing characteristics of an incentive system in the Soviet Union came from the educational character of law. As Charles Lindblom claims, a preceptoral system is a massive, highly unilateral system of persuasion in which a small enlightened government elite instructs the masses, and the superior intelligence of the elite transforms the masses (Lindblom 1977). Soviet scholars claimed that "the dialectics of the relationship between methods of state-provided incentives and persuasion lies in the fact that positive incentives themselves create conditions for good behavior in the consciousness of individuals and collectives" (Baranov 1978, 4–5). Incentive instruments in the Soviet Union were blended with informational or persuasion-oriented instruments as a system of centrally desired aspirations.

In general, Soviet law and regulations divided incentive instruments into material and moral (Danilenko 1989). Material incentives played a leading role among enterprises and individuals. Bonuses encouraged environmentally friendly oriented activities because they were closely tied to the system of redistribution in a socialist system. However, a system of moral instruments was given more significant attention by the government. The basis for such a system was an ideological, political, and creative part of the socialist competition (Kogan 1966; Maltsev 1983). Material and moral incentives helped achieve environmental goals through remuneration and education.

Persuasion, moral inducements, and material awards were supplements within the system of direct regulation. It was believed that raising moral standards would eventually lead to increased understanding of externalities and improved compliance among polluters, which would in its turn result in the achievement of environmental goals.

ECONOMIC APPROACH TO WATER QUALITY CONTROL

Effective application of both direct regulation and flexible instruments requires establishing such regulatory organs, which could cope with the requirements of law and emerging societal needs. The establishment of an independent and centralized policy authority that can experiment with various instruments helps with adopting and disseminating flexible tools. In Russia, a major step toward creating a comprehensive environmental organ happened only in 1988 with the Joint Resolution of the CPSU Central Committee and the USSR Council of Ministers "On the Fundamental Restructuring of Environmental Protection in the Country." The resolution created the State Committee for Environmental Protection (Goskompriroda), which was later reorganized into the Ministry of Environmental Protection (Minpriroda) (USSR Collection of Resolutions 1988; also see chap. 5).

Yet bureaucratic battles never stopped in Russia. After the collapse of the Soviet Union, Goskompriroda, and later Minpriroda, continued to share environmental responsibilities with many resource utilization agencies. By 1994, the Russian Water Resources Committee (Roskomvod) gained control over watershed projects, created watershed directorates under its umbrella, and consequently oversaw water quality programs (Ermakov and Sukharev 1997; Erofeev 2003). By doing this, Roskomvod effectively duplicated monitoring and enforcement responsibilities of Minpriroda. While the 1988 Resolution had the goal of creating a single agency with a broad jurisdiction over environmental protection to prevent the drawbacks of a single-media approach, duplication of responsibilities in multiple agencies hindered the development of a comprehensive policy. The Soviet legacy of authority dispersal and blending resource consumption and protection functions impeded new institutional development and adoption of incentive-based instruments.

Minpriroda retained formal authorization to promote broad, high-level environmental policy agenda. Its main policy influence was sustaining a "polluter-pays" principle and establishing and implementing water quality charges and fees. As demonstrated in chapter 5, emission and effluent charge system started with an experiment in the twenty-nine subjects of the Russian Federation in the late 1980s and early 1990s. Based on the experiment, a single system of pollution charges was introduced with the law "On Environmental Protection" of 1991. Charges were established based on a relative damage of the 197 water pollutants,[2] cost per unit for treatment, and overall revenue considerations. It is important to emphasize that a system of effluent charges was similar in its development to emission charges, and both effluent and emission fees found their origin in the

system of previously established Maximum Allowable Concentrations and Maximum Allowable Discharges.

Legalizing Effluent Charges

The Russian Federation Water Code of 1995 became a landmark in water quality policy. It legalized economic instruments to control water pollution, established a regulatory system, and codified effluent charges and water fees (R.F. Water Code 1995). The code set water quality control based on territorial, basin, or watershed approach. It allowed for a consideration of the interrelated ecological elements of a water basin and economic and developmental factors within watersheds (Articles 111, 120). Nevertheless, the code heavily relied on a traditional direct regulation approach prescribing standards for discharges, and licensing water activities by enterprises (R.F. Water Code 1997, Articles 48, 49).

Executive organs at the federal level, subjects of the Russian Federation, and municipal agencies shared the administrative and enforcement authority. Because of constant reorganization within the bureaucratic system in Russia, along with dispersion of authority among multiple agencies, delegating authority to a specific agency would mean an unavoidable amendment to the code. Thus, it was more convenient to assign the responsibility to a "specially authorized governmental organ" that would be responsible for water quality control. More specific provisions for water protection were to be developed by the Government of the Russian Federation and Minpriroda. The Government did establish detailed regulations including resolutions "On the Rules of Establishment and Confirmation of Maximum Allowable Harmful Influences on Water Objects," "On the Charges for the Use of Water Objects," and others (R.F. Government 1997; R.F. Government 1998).

All water users, according to the Water Code, must comply with the limitations and standards outlined in water quality permits and licenses, whose content would again be developed by the Government, and "specially authorized agencies" at different levels. All water users must employ "economic, technological, ameliorative, agro-technical, hydro-technical, sanitary and other measures" to protect waters from pollution (Article 94). This vague character of the law is striking, especially in comparison to the United States Clean Water Act. It brings to the surface many problems associated with delegating authority from a policy making body to administrative agencies. On the one hand, it can be argued that regulatory agencies are given more flexibility in controlling water pollution and dealing with polluters, which may lead to establishing more effective and less rigid environmental regulations. On the other hand, a lack of prescription leads to confusion in understanding

and implementing the law, overregulation, politicization of administrative organs, and possibly capture by powerful economic interests.

Surprisingly, the economic mechanism for water use and water quality control received a more detailed attention in the law. Main principles of the economic approach were threefold: charges for water use and pollution, governmental financing for water protection, and economic incentives for water quality protection (R.F. Water Code, 1995, Article 121). The code prescribed that all discharges were subject to the effluent charge system. Industries received an incentive to remain within the established effluent limitations to save money. Collected charges would be distributed to specially earmarked budgets for water protection at the federal level (10%), subjects of the Russian Federation (30%), and local budgets (60%) (R.F. Water Code 1995, Article 125). The system of effluent charges was considered not only as an economic incentive for polluters, but also as an aid for the government to promote environmental protection activities.

Similar to U.S. water quality practice, enterprises in Russia had to pay a fee to obtain a license/permit to use waters for discharging. In the United States, such fees are established by state or local agencies, as permitted by the Clean Water Act, taking into account volume, rate, and, in some cases, toxicity of discharge (U.S. EPA 2001c). In Russia, permit or license fees are obligatory and usually cover the administrative procedures of issuing permits. The economic incentive in this case is provided by the system of discharge fees, along with tax breaks, credit privileges, and other incentives to construct water treatment facilities (R.F. Water Code 1995, Article 127).

All provisions of the Water Code, including incentive schemes, came along with the provisions for penalties, prohibitions, and plant closings in cases of noncompliance. Violations of water legislation were punishable administratively through a system of penalties and fines, imposed by regulatory agencies, and criminally through lawsuits brought about by administrative agencies, citizens, and officials in the Office of the Procurator (R.F. Water Code 1997, Article 130; Erofeev 2003). An important feature of this penalty system was the indemnification of a damage caused to water bodies (Article 131). Administrative and criminal penalties would not free violators from responsibility to compensate for the damage to water bodies. However, the code itself neither established the size of penalties nor defined the composition of violations. These are left to the Code of Administrative Violations and the Criminal Code, which again significantly increases the number of policy participants and may lead to lags in enforcement.[3]

A system of water quality control in Russia, which started with the creation of an independent environmental policy authority and proceeded with the establishment of effluent charges and other economic incentives,

opened an avenue for the use of flexible instruments and a more effective water quality policy. However, many procedural complications in policy persisted. The vague character of the law regarding delegation of policy responsibilities, establishment of a date-certain principle, and procedures for determining standards, effluent limitations, rates of charges, and penalties significantly increased discretionary power of multiple administrative agencies, not only the environmental agency. The sheer number of policy actors under the leadership of the Government would require impeccable coordination of water policy implementation and agreement on basic procedures of establishing and revising standards and providing incentives.

EFFLUENT CHARGES IN PRACTICE

Implementing effective water quality policy requires that administrative agencies promulgate regulations and ensure compliance with them. While the law sets the outer limits of possibility, concrete regulations realize legislative intentions and serve as a source of policy provisions. Flexible instruments require policy streamlining as a key to effective implementation and achievement of environmental goals. This, in turn, directly depends on the ability of an environmental authority to provide for coordination and consistency in dealing with other administrative agencies and regulatory targets.

Pursuant to the R.F. Water Code, the Government of the Russian Federation provided for policy guidance and controls, and delegated authority to two main agencies responsible for water quality control—the Ministry of Natural Resources and the Ministry of Environmental Protection[4]—as well as many other ministries and committees[5] (R.F. Government 1996). All interested agencies issue regulations with regard to water use and control.[6] A process of issuing permits involved negotiations between different federal and regional agencies, including the Sanitary Service, Committee on Hydrometeorology, Ministry of Fisheries, Ministry of Agriculture, and others. Permit requirements were based on a system of standards, which were more numerous and stringent than comparable ones in most countries[7] (OECD 1999). Each permit, and hence Maximum Allowable Discharge limits, was established individually for a given discharge point (pipe) and no consideration of other outlets, and thereby cumulative effects in the recipient water body, took place.

Notwithstanding this administrative complexity, and in contrast to air quality policy, water quality policy provisions were more specifically outlined in the law "On the Charges to Use Water Objects" (1998), including effluent charge provisions. Because water resources could be in some cases excluded, and therefore privatized, water rights and responsibilities could also be as-

signed. Moreover, water quality policy in Russia has been often combined with water resource management, which takes its roots from the Soviet strategy of *kompleksny podhod*—comprehensive approach—to resource/pollution policies. This is explicated not only through the system of integrated charges for water use and control, but also through the inherited administrative structure of multiple agencies responsible for water use and protection under the guidance of the Federal Agency on Water Resources within the Ministry of Natural Resources (R.F. Ministry of Natural Resources 2004b).

Based on the Law on Charges to Use Water Objects and the Law on Protection of the Environment, the Ministry of Natural Resources and the State Committee on Environmental Protection promulgated important regulations and methodological requirements for the establishment, calculation, collection, and enforcement of the effluent charge system (R.F. Ministry of Natural Resources 1998; R.F. State Committee on Environmental Protection 1998). A methodology for establishing basic rates of charges was not based on a comparison of marginal abatement costs and marginal environmental damage, which is how it was supposed to be calculated according to Pigovian tax theory. The adopted methodology was based on the economic damage to the environment from pollutants within the MAC limits and the demand for funds on environmental projects and programs (Kozel'tsev 1998; Girusov et al. 2003). The rationale behind such an approach was an unbearable burden on enterprises in case of the Pigovian theory, and a necessity to create environmental financing independent of the federal budget. Such funds would be used to implement various established and proposed federal and regional environmental programs.

In addition to the charge system, the State Committee on Environment specifically encouraged experimentation with policy practices in different regions, with a goal of establishing innovative approaches, which other regions might replicate, and of helping clarify federal-regional cooperation. Furthermore, the State Committee on Environment, along with the State Property Committee, began experimenting with the fundamentals of environmental auditing, certification, liability, and insurance systems. While the Law on Environmental Protection established a legal basis for an elaborate regime of liability and compensation for environmental damage, the system of environmental insurance is still in its embryonic stage, and the experience with environmental insurance funds in some regions is yet to be generalized (Erofeev 2003).

Despite the fact that there was still a relative lack of *multiple* flexible instruments, the pollution charge system was continuously updated. The requirements to authorize polluted discharge were revised by the Government regulation "On Minimum and Maximum Charge Rates for Use of Water Objects within River Basins, Lakes, Seas, and Economic Regions"

(R.F. Government 2001). All water users were obliged to pay a fee to discharge into water bodies, based on the volume of discharge and in conjunction with the payments for polluted effluents (R.F. Ministry on Taxes and Collections 2001). If an enterprise exceeded the established maximum allowable limits, written into the license, increased charges—five times the basic rate—would apply. These "ecological coefficients" were used to raise per-unit charge especially under specific conditions, including above-limit discharges in ecological emergency areas.

The system of Maximum Allowable Discharges became more flexible through the introduction of Temporary Allowable Discharges (TADs) of pollution, which was a compromise agreed to between polluters and an environmental authority, considering such factors as costs of environmental protection measures, financial state and size of enterprises, local ecological conditions, and the like. The TADs became a part of the "polluter-pays" principle, which increased in stringency to reach initial established limits in a fixed period. Discharges above the TAD limits were charged a twenty-five-fold penalty.

Moreover, to alleviate the shortage of financial resources and the problem of nonpayments by enterprises the system of charges included additional flexible provisions. A system of tax credits and waivers as provided by the Water Code and the Law on Charges to Use Water Objects allowed for up to seventy to eighty percent of the overall discharge payments to be left in enterprises' accounts only if they could guarantee to spend these funds on environmental improvements. This approach could also be seen as a subsidy for polluters from environmental funds. Another incentive for enterprises was provided by a system of grant allocation for those enterprises, which undertook additional environmental protection measures. Grants were allocated not only for environmental projects, but also for general economic purposes such as construction of plants with innovative technologies (Kozel'tsev 1998).

In this sense, the effluent charge system was very similar to the emission charge system, which formed a part of the overall system of pollution charges. A system of enterprise pollution permits and pollution charges represented a combination of standards, controls, and emission fees. Initially very effective, the system lost some of its incentive effect due to rapid inflation and the inability or unwillingness of enterprises to pay (Khamitov 2004; Girusov et al. 2003; Kozel'tsev 1998). Frequent bureaucratic reorganization also reduced the capacity of environmental protection authorities to exercise their responsibilities or introduce innovations with regard to policy instruments. The main purpose of the current system appeared to raise revenue. However, indexing pollution charges still ensured that it was more expensive to pollute than to comply. Moreover, in the case of Russian water quality policy, improving the

incentive part of the charge system in addition to revenue collection was ensured through the introduction of toxicity indices and penalties (five and twenty-five-fold "ecological coefficients") to create stimuli for enterprises to eliminate the most toxic and above-limit discharges, which represented the premier threat to human health. However, if Russia were to move to the use of multiple and various policy instruments, a productive effort would involve prioritizing goals, reducing the list of pollutants, and earmarking environmental revenues for environmental protection purposes.

Policy Revisions

Presently, the Russian government is revising its system of pollution charges. The main obstacle to effective application of the charge system lies with the complexity of current water quality legislation and regulatory provisions, inconsistencies between multiple provisions, the financial difficulties for polluters to pay the fees, and the enormous lists of pollutants and standards currently in use that do not motivate industry to cut its pollution.

Multiple ministries, the Government, and the State Duma are discussing the new Law On the Charges for the Negative Impact on the Environment. One of the main controversies is whether to preserve the charges for the discharges within the established limits. On the one hand, industries in compliance with the established pollution standards should not be penalized. On the other hand, many enterprises, instead of gradually improving their environmental performance through upgrading production processes and reducing the volume of discharge, are dissolving wastewater in large amounts of water to ensure that concentration limits are not exceeded. This approach results in a significant increase in clean water consumption and wastewater discharges, thereby producing negative environmental impact.

Further, an enormous number of water quality standards laid down in Russian legislation necessitates follow-up with enforcement. Otherwise, there is no reason for stipulating these requirements in water legislation. A binding list of a manageable number of substances to be regulated or phased out could be a better option, especially for toxics. The binding list should be regarded as subject to periodic updates due to new information, evolving priorities, and changing conditions. Such an approach is enforceable and it allows industries and agriculture to integrate environmental problems into their planning processes and to look for solutions to substitute a specific substance or consider best available technologies.

Presently, the adoption of the Law on Charges strongly depends on substantive inputs from the Ministry of Natural Resources, an approval by the Government of the draft of the law, and the ability of the State Duma to take ministerial and Government recommendations into account (R.F.

Government 2003; R.F. Ministry of Natural Resources 2004c). A very dispersed character of policy authority remains a barrier to the adoption of the law and effective functioning of the charge system. However, the passage of the law would drastically change the legal status of the pollution charge system in the country, providing a clearer mechanism of establishing and assessing the fees for enterprises as well as offering an incentive for industry to achieve better environmental results.

NEW WATER CODE

President V. Putin signed a new Water Code, an update from the Water Code of 1995, in May 2006. From the instrumental point of view, the value of the Water Code is the normative and economic mechanism part of the code, which establishes the charges for water use and pollution, governmental financing for water protection, and economic incentives for water quality protection.

Surprisingly, the new Water Code does not elaborate or improve on the system of economic instruments (R.F. Water Code 2006). A "polluter-pays" principle establishes effluent charges and incentives by stimulating rational use and protection of water resources, but with no indication of how such incentives would work. Calculation of charge rates and a setup of an incentive mechanism are the responsibility of the Government, not an environmental protection organ. All provisions for the use and protection of water objects are still supported by the command-and-control requirements. Noncompliance with the system of pollution charges and violations of water quality standards are penalized in the order established by the Code (R.F. Water Code 2006, Articles 18, 36, 68).

Fortunately, the Water Code continues to emphasize a goal-oriented and basin character for water use and protection in Russia (R.F. Water Code 2006, Articles 28, 29, 31, 32). However, many issues of jurisdictional responsibilities are nonetheless confusing. It is still puzzling why the code does not authorize an agency such as the Federal Service on Water Resources within the Ministry of Natural Resources or the Federal Service on Environmental, Technological, and Atomic Control to establish the standards for water quality, limits on polluted discharge, as well as the procedures for monitoring and control. The establishment and confirmation of standards and discharge limits are again delegated to the Government or a "specially authorized executive organ." If the Government is given authority, it can in turn re-delegate to another executive organ (R.F. Water Code 2006). The difficulty of arriving at a decision on the use of incentive-based instruments without a leading and coordinating role of a centralized environmental

policy authority is also clear from the words of State Duma Deputy Nikolai Sukhoi: "Multiple agencies were working on the Water Code, including the Ministry of Finance and Economics . . . the Ministry of Natural Resources did not play the leading role" (Sukhoi 2004).

The new Water Code has a referring character. Water use and protection requirements are not clearly defined by this Code, but rather outlined in a general manner, often passing the responsibility to formulate water quality protection principles to the "norms, contained in other federal laws, laws of the subjects of the Russian Federation, presidential orders, and governmental acts" (R.F. Water Code 2006, Article 2). This makes Russian water quality legislation remarkably different from the U.S. water quality law, which constitutes a concrete and logical framework for further development of national water legislation and regulations. This problem with Russian legislation raises a series of questions about an increased discretionary authority of multiple administrative organs, which can lead not only to confusion in implementation, but also to a shift in power relations among the agencies or between the agencies and the regulated.

Russian water quality legislation is at the same time very complex and always changing. These changes, however, do not always promise better or more innovative approaches to water quality protection. A real improvement in the system of pollution charges may come with the passage of the Law on Charges for the Negative Impact on the Environment and possibly with the development of other strategies and flexible tools. Discharge standards are still calculated for each particular point source of pollution without consideration of a cumulative effect for all point and non-point sources. In this case, applying a "bubble principle" may become crucial in providing flexibility to enterprises and stimulating environmental protection. The U.S. practice serves as a vivid example of how a move toward "bubble" policy may foster the development of various flexible instruments in pollution prevention and control.

New developments are all the more possible, because Russia already has a framework and a legal basis for the introduction of various flexible approaches. The Law on Environmental Protection (Articles 14, 18) authorizes the establishment of incentives and stimuli for enterprises. Among them are tax breaks for governmental and private entities employing waste minimization technologies and processes, environmental insurance, tax exemptions for environmental funds, rights to use environmental funds for enterprises on a contractual basis, and increased taxes for harmful substances (Erofeev 2003).

The biggest obstacle, however, within the existing system of water pollution control, as well as with other areas of environmental protection, is the legal and institutional legacy of Soviet times that casts its shade on

contemporary developments and policy implementation practices. The lack of a centralized environmental policy authority inhibits the development and effective application of flexible and even direct regulation instruments. While all economic incentive-based tools are placed onto a well-established framework of standards, the standards themselves need to be revised to fit the always changing demands of environmental policy and society. The main positive elements in the development of flexible approaches in Russia remain statutory endorsement for the use of incentives and provisions for an accountability of incentive-based tools by sustaining direct regulation provisions for penalties and compliance control.

CONCLUSIONS: REGULATORY TRADITIONS AND POLICY RESTRUCTURING

The Soviet Union was the first country to set limits on the discharge of various types of industrial effluents. In both air and water quality cases, maximum allowable concentrations of pollutants were much stricter than those established in other countries. Yet the improvement in water quality has been slow. While significant results in enhancing water quality were achieved through direct regulation for some water bodies, in other geographic areas and economic zones pollution persists, and water resource productivity declines. Additionally, Russia has been left with many institutional legacies that add to the difficulties in clean water policy. These include the highly dispersed nature of environmental policy authority and administrative structures, as well as a prioritization of economic over environmental imperatives.

A view that reflected Soviet environmental protection strategies—optimal use of nature according to rational scientific and legal principles—was not only prevailing in the 1960s and 1970s, but has been effectively carried into contemporary Russian environmental policy. A primary thrust of this expression was not toward prevention and protection per se, but instead toward "rational" and sensible utilization of natural resources, including water resources. Presently, it is exemplified in the very institutional configuration of environmental policy authority, where a significant overlap exists between resource utilization and environmental protection functions.

As in the United States, in Soviet and post-Soviet Russia, there has been an almost absolute reliance on detailed central regulation and authorized prohibitions, under which discharge of pollutants was prohibited except in accordance with certain approved conditions. Similarly to the U.S. practice, water quality policy in Russia emphasized generous governmental investment in pollution control and subsidies for the construction of waste treatment plants by enterprises and municipalities. However, constantly evolving soci-

etal needs demand better results in environmental protection. The rapidly changing nature of the Russian economy and polity demonstrates a need for more effective and flexible approaches in water quality policy.

The introduction and use of flexible instruments, especially pollution charges, as some scholars argue, not only entail significant efficiency gains in countries with transition economies, but also is not very difficult (see Bluffstone 1998). However, the Russian water quality policy case challenges this view and demonstrates that instrumental innovations presume the existence of a well-functioning institutional framework. It becomes much more difficult to establish and implement pollution charges in a system in which institutional practices and jurisdictions established in the past are not only prevalent but also ineffective, resulting in institutional inertia in political and administrative realms.

The case of water quality policy in Russia explicitly demonstrates a significant influence of a traditional regulatory framework on the introduction of flexible tools. The experimentation with a pollution charge system, establishment of effluent charges, and attempts to develop such approaches as environmental insurance and liability occurred only when water quality control was located in a relatively independent State Committee on Environment or the Ministry on Environmental Protection. However, for the most part, and even presently, environmental regulation continues to be fragmented, and many of the institutions responsible for it are unstable. Water quality standard setting and approval remain a responsibility of the Government in general or several ministries and committees at different levels of government that have their stake in the water resource and water quality policy. Within the Ministry of Natural Resources, the Federal Service on Water Resources is mainly concerned with rational utilization of water resources. While many different governmental departments seriously acknowledge the necessity of improving the system of pollution charges and applying a variety of instruments to protect water quality, the environmental policy authority is being dispersed and, in many cases, overshadowed by the demands of a struggling economy.

During the Soviet era, moral and material incentives were usually established by joint resolutions of the Party, the highest echelons of the government, and the Supreme Soviet in the form of decrees, normative acts, and provisions in the Principles of Water Legislation. In contrast to the U.S experience, where the EPA was a leader in initiating flexible controls, in Russia, the introduction of incentive-based instruments belonged to multiple regulatory agencies, including an environmental regulatory organ, as well as some initiatives of the State Duma. Presently, an agreement on a new scheme for pollution charges is difficult to achieve because the Duma, the Government, and a number of ministries have to come to a common

understanding. The situation is especially exacerbated by a relative lack of aggressiveness from the Ministry of Natural Resources or the Federal Service on Environmental, Technological, and Atomic Control, which allegedly should provide leadership in establishing flexible regulations.

The types of extant standards also determine the fate of flexible tools in water quality policy. Because Russian water quality standards are so numerous, diverse and strict, and because discharge limitations were already calculated for many enterprises, based on toxicity, location, volume of discharge, and so on, establishing an effluent charge system was a reasonable and straightforward step toward offering incentives. Initiating effluent trading schemes would be an enormous task, providing that the standards and limitations are imposed on each discharge point. Moreover, calculations of charge rates and indices were based on approved federal or regional environmental programs, which supply an incentive for the regulatory agencies to work with the charge system. In addition, the system of charges only complements a direct regulation approach. Using existing fines and penalty practices as a measuring rod for implementing flexible tools enhances the reliability of new tools. Water quality policy in Russia is credited with the environmental damage indemnification function. If a very serious threat to water bodies occurs, polluting enterprises would be held responsible for damage compensation. The application of enforcement mechanisms in case of noncompliance preserves the credibility of incentive-based approaches.

Finally, the difficulties of attaining established goals through traditional methods facilitate the use of flexible instruments. The system of pollution charges in Russia exists mainly for two reasons. First, pollution charges aim at providing incentives for polluters to internalize external costs of production and thereby reduce environmental damage. Second, charges generate revenue to help pay for public environmental expenditure and support already established goal-oriented programs (Kozel'tsev 1998). Earmarked revenue generating has become a very important reason for introducing a pollution charge system in Russia.

Water quality policy case in Russia also raises many other crucial questions with regard to modes of governmental functioning. First, while pollution charges, being market-based tools, can help enhance cost-effectiveness of environmental regulation, many problems of pollution control are not fully solved solely through such mechanisms. For Russia, as well as for many transitional economies and other countries, the development of a variety of flexible regulations becomes a key in improving their environmental conditions. Larger initiatives from a centralized environmental governmental agency would allow the government to implement innovations in environmental policy. Incentive structures, which are currently in use, provide potentially good bases on which to continue building diversified systems of flexible

instruments. This is especially true in countries where the law already authorizes the application of new approaches.

In addition, a country in transition can benefit from the experiences of other countries with a variety of flexible policy tools, especially the U.S. experience. The development of a "bubble principle," pollution trading schemes, and environmental audit has been successful in the United States due to the well established and respected structure and culture of markets and regulatory initiatives of the EPA. While Russia currently lacks a fertile ground for the growth of stable property rights relations and is still in the process of developing market approaches and price forming mechanisms, many strategies used in the United States are perceived as very appealing for Russian environmental policy (Girusov et al. 2003). Russian legislation already provides for the development of such procedures as environmental audit and liability, though in many cases on a voluntary basis. There are also a number of training initiatives provided by the U.S. EPA in the areas of water quality improvement and watershed management. While historically inhospitable attitudes and a larger context of pollution charge system may make the introduction of trading mechanisms more difficult, there is currently some progress with regard to awareness creation and human capital formation to introduce marketable permits in Russia. Invariably, adopting Western instruments for environmental management to the specific requirements of the country in transition represents great new challenges. However, this may also provide opportunities for institutional innovations and stimulation of capacity in dealing with environmental challenges.

Further, the Russian water quality case, as well as its air quality case, demonstrate the seriousness of the problem of authority delegation to regulatory agencies. Russian water legislation remains very general and refers to a number of other laws and regulations. Additionally, the law itself does not specifically identify agencies responsible for implementation. These factors lead to confusion in dividing responsibility and ensuring accountability, as well as to protracted negotiations among agencies themselves. In this case, establishing flexible instruments may mean significant initiation costs for both regulators and the regulated. These costs come in the form of administrative effort and time, and not only as upfront investments by industry to take advantage of a regulatory tool. Moreover, insufficient clarity in delegation serves as an obstacle for the regulated to establish the chains of relationships with regulatory bodies, and as a risk of subverting the design and operation of the instrument to meet policy goals. Many other countries, which are developing environmental legislation, should understand the seriousness of producing detailed and precise legal provisions.

Finally, policy innovation mechanisms are intimately related to the debates on shifts in governance that emphasize their multiactor and multilevel

characteristics. From this perspective, such concepts as planning, direction, and implementation in the narrow sense are developing into a framework that conceptualizes policy processes from a perspective of coordinating social actions to achieve better policy performance. This is especially true in federal systems, which strive to realize a new mode of inclusive governance in which policy formulation and application become more attuned to the reality of policy delivery at different levels and through a variety of actors. Pursuing policy changes primarily demands specific initiatives by governments to better integrate social goals within the mandate of existing institutions through guidance and mediation. However, achieving greater policy coherence also requires sustained efforts to improve coordination and ensure policy integration across different levels of government and various policy actors within the economy and society.

CHAPTER 7

Comparison and Conclusions

The growing use of incentive-based instruments and attention to flexible regulation among scholars and policy practitioners signify that the world of government is changing from imposition and control to governance. States around the world have been moving toward democratization, devolution, and an inclination to doubt whether direct governmental intervention and regulation are the best means for coping with changing demands of society and economy. Such tendencies suggest that flexible approaches and incentive-based policies will become even more significant in the future. It also reflects the motivation by governments to introduce innovative programs and support flexible regulation. Of the equal importance are the context for flexible regulation and the legacies of policy practices. The conditions of policy making and the problems to which new approaches need to be applied act on the background of regulatory realities, but are still changing. This indicates that programs are best conceived to become adaptive so that they can react flexibly to changing demands of the political and socioeconomic concerns.

This book has shown the evolution of flexible regulations in the United States and Russia. It demonstrated how the political process, the institutional arrangements, and the existing practices influence the introduction of incentive-based instruments for pollution control. Experience with many efforts to streamline regulation, achieve greater compliance, and ensure better environmental results support the argument that institutional, procedural, and structural conditions shape the likelihood of flexible regulation. The feasibility of flexible tools in environmental policy depends on the nature of policy authority, the type of extant regulations, and the implementative capabilities of agencies rather than simply cost-effectiveness or technical rationality of the instruments.

As we have seen, the basic strategy to control air and water quality in both the United States and Russia has been the adoption of a variety of direct regulation methods to reduce air and water pollution. At the federal and state (regional) levels, environmental authorities have sought to regulate the behavior of polluters by issuing pollution permits and specifying detailed standards for ambient quality or construction and operation of industrial plants. To enforce these regulations, environmental authorities have imposed penalties and fines, and in the United States have often turned to the courts to resolve conflicts. In both countries we have also seen a movement from exclusive use of command-and-control toward the introduction of flexible incentive-based instruments to improve environmental quality. The U.S. experience demonstrates an early introduction of flexible approaches, and an evolutionary development toward the use of multiple and various flexible policy instruments. The Russian experience also reflects an evolutionary character of inclusion of incentive-based instruments, but Russian policy lacks institutional stability and a variety of flexible approaches, whose legality and applicability are constantly contested. Both countries have faced and are struggling with numerous challenges in adopting flexible regulations, as the nature and structure of established policy authority and regulatory traditions significantly affect the development of new tools.

This chapter integrates the findings from the case studies to explicate the similarities and differences in the adoption of flexible tools in the United States and Russia. A comparison within the framework of five propositions, outlined in chapters 1 and 2, serves as a technique to illuminate the structural and historical determinants that institutions place on policies and instruments. It demonstrates the presence of specific causal relationships within the cases that reveal that the cases that may be perceived as very different in fact converge in ways previously not observed or expected. This chapter proceeds to argue that a traditional discussion of environmental policy instrument choice in many countries has been too narrow by devoting attention to the inherent characteristics of instruments while ignoring the prerequisites of adopting a preferred policy alternative. Continuity with legal arrangements, administrative structure, and a pattern of institutions shape the process and influence the probability that flexible policy instruments will be introduced. This chapter concludes by claiming that discussing and analyzing institutional determinants for the introduction of flexible tools are instructive because of their implications for political and structural feasibility of effective environmental policy in different countries in the world. Moreover, this analysis of policy instrument adoption contributes to the historical institutionalist agenda, and raises important questions about the relationship between policy choices and the elements of good governance.

LESSONS FROM COMPARATIVE ANALYSIS

The introduction of flexible incentive-based instruments in environmental policy began more than thirty years ago in different countries of the world, including the United States and Russia. However, the success of the adoption of flexible varied and in some cases progress has been painfully slow.

The cases of air and water pollution control policies in the United States and Russia provide a more detailed picture of policy instrument designs than the usual accounts found in the pollution control literature. Systematic and detailed comparative institutional analysis allows us to demonstrate the existence of specific patterns of events and causal relationships within the cases and between these two countries. This section is devoted to a comparison of regulatory structures, methods, and policy designs to explicate the similarities and differences in the adoption of flexible tools in the United States and Russia.

Location and Nature of Environmental Policy Authority

One of the most influential factors for the adoption of policy instruments is the location and character of environmental policy authority. The U.S. and Russian cases demonstrated that a comprehensive, independent, and centralized environmental agency possesses a greater ability to introduce policy innovations and pursue policy goals than a pollution control authority, which is fragmented, dispersed, or possesses very little autonomy.

In both countries, with the appearance of environmental awareness, regulatory activity shifted from mainly promoting economic development to protecting the public at large. Initial responses to protect the environment were urging greater efficiency in the operation of existing structures. There has been a trend in both countries to place environmental programs in public health departments or fragmenting environmental control among agencies with the goals of commodity development. In many cases, pollution control was the responsibility of state, regional, or local authorities. However, kinds of demands placed on the government and politics were new, and authorities that were given environmental tasks found that the environmental push was rather different from their traditional mission of commodity development (Hays 1998; Ziegler 1987). This resulted in ineffective implementation and enforcement efforts and very uneven environmental protection among states and regions.

To cope with these problems, in both countries, environmental responsibility was elevated to the federal level and command-and-control was chosen as a primary tool to curb pollution. In the United States, the

Environmental Protection Agency assumed the tasks of controlling pollution. In organizational terms, pulling together into one agency a variety of research, monitoring, enforcement, and standard-setting activities previously scattered among various agencies permitted a response to environmental problems beyond any previous capability. In Russia, by contrast, environmental policy authority continued to be dispersed among a number of agencies with a duplication of functions, and resource use agencies dominated the agenda. When environmental oversight function is vested in multiple agencies with different missions, it creates a conflict of interest that is seldom beneficial to consistent environmental efforts.

In all countries, some other agencies are responsible for pollution control and prevention. However, with the formation of Environmental Protection Agency, there was much more policy guidance and coordination in the United States. The EPA controls the establishment of standards, emission levels, and policy instruments and techniques. In the Soviet Union, policy process encompassed a whole array of organs. Standard-setting occurred at the national level through negotiation, and emission limits were established by negotiations at the local level with a reference to national norms. In addition, control techniques were set primarily within the ministry authorized to design and produce the equipment responsible for polluting in the first place. Presently, environmental policy tools in Russia are established by many federal laws and governmental regulations produced by multiple federal organs, regional environmental protection agencies, and local authorities.

In the United States, the EPA, as a central environmental authority, evolved its view of flexible instruments from modest offset and netting rulings to proposals of emission trading and the introduction of voluntary schemes for enterprises on a larger scale. Throughout the years and stages of policy development, the agency pointed to new directions in air and water quality control. While multiple states had the opportunity to experiment with flexible controls, and some did with effluent trading or permit fees, it was the EPA that provided guidance as well as regulatory and technical assistance to the states. While the states may find it difficult to cope with the methods of traditional direct regulation, the federal agency's greater insulation from powerful local interests gives it the opportunity for leadership.

In Russia, by contrast, a continued problem of policy authority fragmentation and departmentalism, where segmental interests are pursued by multiple agencies at the expense of general welfare, frustrates new solutions to environmental problems. The leadership provided by the State Committee on Environment during its short period of existence resulted in experimentation with pollution charges, establishment of effluent charges, and attempts to develop such approaches as environmental insurance and liability. Presently, environmental regulation continues to be fragmented. Protracted battles over

the design and implementation of flexible instruments can be attributed to a lack of coordination from an independent authority providing for guidance and consistency in the adoption of new policy approaches.

Policy guidance and coordination are indispensable for encouraging and sustaining comprehensive and systematic efforts to streamline regulation, experiment with new approaches, and ensure that environmental goals are met. The initiatives of an agency, committed to a distinctive and unified set of interests and purposes, shape the direction of policy development and influence the adoption and dissemination of new instruments.

Source of Policy Provisions

Policy is destined to be made in the legislatures, but regulatory agencies take initiatives in introducing flexible instruments, become the source of policy provisions, and initiate legislative response with regard to the introduction of flexible tools. While making policy and specifying methods of intervention are within the realm of legislatures, a number of governmental institutions can be identified as having a role in the supply of policy provisions. The U.S. and Russian air and water quality cases demonstrated that in complex federal bureaucratic societies not all policy decisions are made in the political branches of government. In both countries, regulatory agencies affect policy choices through normal mechanisms of policy implementation as well as through the adoption of innovative approaches to implementation and regulatory reforms.

In the United States, the establishment of flexible instruments to control air and water pollution to a large degree depended on the initiative of the Environmental Protection Agency, and in some instances on the activities of state regulators. A wide array of policy tools, from "bubble" policy to marketable permits to voluntary approaches, found its origin in the EPA's Office of Policy, Economics, and Innovation. Whereas policy makers insisted on a strict command-and-control approach, especially in water quality policy, regulators placed an increasing emphasis on flexible tools and techniques. Starting in 1970s, EPA regulations promoted privately arrived at arrangements among different enterprises, which was later taken up in the legislative arena. By integrating flexibility into regulations, the EPA served as an initiator of policy provisions.

In Soviet and present-day Russia, the introduction of incentive-based instruments is also shaped by initiatives of the regulatory branch. However, in Russia, a trend toward dispersed authority results in a joint effort of a policy making body and a number of administrative agencies. During Soviet times, the Party and the Council of Ministers promulgated moral and material incentive schemes. An experiment with pollution charges was the initiative

of the administrative agency—the State Committee on Economic Reform. While the State Committee on Environment developed and disseminated a system of pollution charges and attempted to introduce multiple other innovative approaches, its activity was most prominent only after the passage of the law authoring the use of various approaches. The significance of regulatory innovation and reform, however, comes from the very referring and vague character of law in Russia. Presently, the Government is the ultimate regulatory organ, which delegates authority for policy development to multiple agencies responsible for policy direction and implementation.

A primary reason why regulation contributes to policy choices is that law or policy statements can never be sufficiently specific or flexible to cover all future applications. The function of regulatory agencies is then to cover all the gaps of official policy. This, however, points to a problem of authority delegation and discretion by regulatory agencies. In the United States, use of regulatory discretion over pollution allowed the EPA to achieve more pollution abatement through flexible approaches than would be in the case if it insisted on stringent controls and immediate compliance. In Russia, insufficient clarity in delegation and exercise of discretion by multiple agencies over the same problem contributes to difficulties in regulation.

Institutional Templates

As instrument choices bind societies sometimes for decades, long-term strategic aspects, such as their fitting into overall regulatory developments, are an important element in their establishment. Flexible instruments that do not challenge the deeply entrenched institutional practices and that fit the existing regulatory framework have a much better chance of adoption.

Both the U.S. and Russian air and water policy cases demonstrated that flexible instrument adoption is strongly influenced by the regulatory practices and the types of standards in place. Theses two countries introduced different flexible approaches to pollution control: in the United States, the use of pollution trading is a dominant strategy; in Russia, the use of pollution charges received widespread attention. Adoption of pollution trading in the United States was certainly easier than in Russia because of the well-developed structure, institutions, and culture of markets. The incentive effect under a system of marketable permits, however, is similar to a pollution charge approach. Those sources that currently pollute but can reduce emissions or effluents at a lower cost will take control measures. Those sources for which pollution prevention measures are much more expensive would pay the fee or buy pollution permits.

The United States adopted pollution trading schemes more readily to control air pollution because such tools did not require a fundamental reor-

ganization of the regulatory system. Initial command-and-control air policies were based on ambient quality standards and quantitative emission limits, which allowed accommodating emissions trading. The U.S. water quality case demonstrates even more vividly that the types of extant standards determine the fate of flexible tools development. Initially adopted rigid technology requirements did not leave much space for innovation and flexibility. Such standards prescribed the method of pollution control, not the goal. Only with a shift to water quality standards—performance standards—was it possible for the regulators to turn their efforts to developing various techniques, including flexible instruments such as effluent trading. Currently, EPA's innovation strategies and voluntary approaches are designed within the system of existing regulations but are aimed at streamlining regulation, improving compliance, and achieving superior environmental results.

In Russia, both the air and water quality cases also demonstrate that the type of an established regulatory framework and a system of standards determine the future of incentive-based tools. Pollution charge rates for air and water are calculated based on the existing limitations, where fees are indexed to reflect the level of compliance. Two-tiered rate structures with base rates for pollution up to the limits and higher rates for pollution above the limits fit well with the existing permit system. However, a complexity of application of existing flexible approaches demonstrates a complexity of the established regulatory scheme. It is an enormous list of regulated pollutants and the strictness of pollution standards that hold back many expected improvements for the charge system. If Russia is to advance its current incentive system and move to the adoption of other flexible instruments, such as a "bubble" principle or pollution trading, it has to simplify the existing system of standards, focus its attention on the most important pollutants, and cease a single-smokestack regulation practice. The absence of an institutional prerequisite does not mean that the introduction of a variety of flexible instruments remains forever unfeasible. Rather, it indicates where and what type of effort in institutional development would be required before such instruments could be introduced and implemented.

The adoption of new policy approaches and strategies depends on institutionalized patterns and routines of policy making. Creating new instruments requires attention not only to the nature of a problem, but also to evaluating compatibility with the existing regulatory framework and standards. The United States and Russia's experience with the introduction of flexible instruments demonstrated an evolutionary process of accommodation. Innovations in policy that failed to build on what has gone before ran the risk of significant opposition and unintended consequences. Radical change was much more difficult to accommodate than a gradual change. Flexible instruments, representing new approaches to environmental protection, borrowed aspects

of order from conventional regulatory practices and were combined with other policy instruments in a setting that largely depended on institutionalized patterns and routines of policy making and implementation.

Accountability

Direct regulation and flexible instruments are sometimes presented as complete opposites. However, both approaches involve imposition of pollution controls, which are fixed by standards, rules, and regulations. Both approaches must satisfy standards of certainty, fairness, and procedural justice (Mann 1982). Flexible instruments do not replace existing regulations and enforcement provisions. They are implemented on the background of direct regulation, which remains in place as a "safety net" in policy implementation.

In the United States and Russia, incentive-based instruments were grafted onto existing systems of direct regulation and enforcement to ensure accountability. In the United States, the adoption of trading schemes and voluntary approaches was supported by a well-established system of noncompliance penalties, fines, as well as civil and criminal liability. The Clean Air Act authorizes administrative, civil, and criminal penalties of up to $25,000 a day per violation. The SO_2 Allowance Trading Program sets automatic penalties for not holding enough allowances at $2,000 per ton (U.S. EPA 2003a). Water quality trading and voluntary approaches preserve minimum technology requirements, and are incorporated into a national pollution discharge elimination scheme, which is aimed at preserving minimum levels of water quality protection. The provisions for penalties in trading schemes and multiple other flexible approaches are specifically mandated by law, as well as cemented in EPA's regulations.

In Russia, a system of emission and effluent charges is combined with direct regulation provisions of noncompliance fines, penalties, and civil and criminal liability. Improving an incentive part of the charge system is attempted through the introduction of toxicity indices and penalty (five and twenty-five-fold "ecological coefficients"). This creates stimuli for enterprises to eliminate the most toxic and above-limit discharges, which represent the most significant threat to human health. Indexing pollution charges is aimed at ensuring that it is more expensive to pollute than to comply. Moreover, an elaborate system of pollution permits forces unlicensed enterprises to pay higher fees.

There are, however, two significant differences between instrument formation in the United States and Russia. One is found in the application of a compensation for the environmental damage principle. In contrast to the United States, the Russian Constitution has a specific provision for environmental rights—the right for a favorable environment, the right to

receive information about the environment and, most important, the right to be compensated for the damages due to environmental violations. Compensation for the damages and nuisance law was the basis of environmental protection strategies in the United States before the 1960s and 1970s, when it was replaced with direct regulation measures, carrying violation-penalty relationship. In Russia, compensation for the damages principle, in addition to penalties and fines, is still a prevalent trend in policy design and implementation. Constitutional provisions and provisions of the Law on Protection of the Environment reinforce a system of rights, which provides for links between the right to use the environment and the obligation to pay for the damages to the environment and individual citizens. A "polluter-pays" principle, exemplified in the system of pollution charges, is a manifestation of this system of rights.

A second difference lies in the extent to which courts are involved in resolving disputes, assigning liability, and influencing application of instruments in general. While administrative, material, civil, and criminal liability are used in both countries, the United States law is more detailed and it specifically authorizes civil, criminal, and citizen-initiated suits in environmental policy to ensure legal liability and court enforcement. Central to the U.S. pollution control policy is a practice of litigation to force compliance and ensure just regulation. In Soviet Russia, legal process was not central to conflict resolution. Administrative processes and negotiation, both formal and informal, were far more important than litigation. Presently, in Russia, the role of courts is increasing, and air and water quality legislation authorizes civil and criminal suits to resolve environmental disputes. Enterprises, regulatory agencies, and citizens are now turning to courts to settle environmental conflicts. However, the role of courts in enforcement is still insufficient. Policy disputes are resolved through negotiations among government agencies, regulators, and regulatees, as well as through discretion enjoyed by enterprise inspectors.

Notwithstanding these differences, both the United States and Russia are striving to improve environmental compliance by adhering to principles of predictability and accountability. Mapping new instruments onto an existing system of enforcement can promote environmental compliance through the application of flexible tools. Predictability and accountability in the design and application of policy rules are important factors for the adoption of effective flexible instruments.

Implementation Aid

Inherent and emerging shortcomings of direct regulation and difficulties in achieving policy goals with command-and-control instruct the move

toward flexible instruments adoption. A relationship between institutional developments and instrument adoption points to problems found in existing regulatory regimes. When an established regulatory practice proves incapable of tackling environmental problems generated by its functioning, a potential for developing strategies that are more effective is increased.

Direct regulation methods have been used most extensively in many countries in the world. Command-and-control instruments are believed to work best when policy making and regulatory bodies lack experience with pollution reduction, when metering total mass emissions is not feasible or very difficult, and when pollution has serious local health impacts, and flexible instruments might result in a worsening of environmental quality. However, direct regulation imposes significant costs on both regulators and regulated in terms of resources, complexity, and efficiency. Instrument application for both polluting sources and regulating agencies can be less costly and time-consuming if regulations are not overly burdensome and possess an incentive, choice-based character. In this case, the use of flexible instruments for environmental protection may be seen as one way to achieve more efficient government, and to encourage environmental compliance.

In the United States, the experimentation with and introduction of pollution trading schemes and voluntary approaches by the EPA has been aimed at the increased cost-effectiveness of the programs, voluntary attitudes that build mutual understanding and trust, but also at reduction of implementation burdens by agencies. In both air and water quality regulations, difficulties of attaining established goals through traditional methods—uniform standards and technology forcing—facilitated the introduction of flexible instruments. Innovative approaches that increase flexibility for the regulated enhance the implementative capabilities of regulatory agencies themselves.

In Russia, the goals of multiple regulatory agencies are not only to protect the environment, but also to increase revenue collection. Pollution charges generate revenue to help pay for public environmental expenditure and support already established goal-oriented programs. Earmarked revenue generating has become a very important reason for introducing a pollution charge system in Russia. A major difficulty in Russia that decreases the implementative capability of administrative agencies lies in the constant bureaucratic battles over policy design and implementation and a refusal to simplify the regulatory framework.

The U.S. and Russian air and water quality cases point to the substantial influence of institutional factors on policy choices. Continuity with legal frameworks and organizational settings of a country, regulatory traditions, and patterns of institutional practices shape the process of policy instrument adoption.

STUDY OF POLICY INSTRUMENTS AND HISTORICAL INSTITUTIONALISM

Understanding policy design and choices of specific policy instruments as being dependent on institutional configuration and practices contributes to the historical institutionalist agenda. First, historical institutionalism examines the way in which institutions shape political choices and policy outcomes. Policy processes are viewed in a framework of the institutions in which they take place (Andersen 1994; Steinmo 2001). This suggests that a success of a particular policy alternative may be rooted in specific institutional configurations developed in a particular society. As this study demonstrated, flexible policy instrument choices in the United States and Russia largely depended on the established institutional practices within these two countries.

A historical institutionalist analysis centers on institutional origin, change, and the consequence of such change on policy choices. Institutional continuity affects the character of policy choices, and may mean incremental policy reform, where the starting point of existing policies directs the development of approaches that would be feasible. A change within the institutional framework or practices, on the other hand, would function as a filter for policy approaches, favoring some new strategies over others. Consequently, policy innovation may be perceived as taking advantage of the institutional change. If such opportunities are realized, the result will be a departure from previous policy choices and strategies. As this book demonstrated, specific flexible policy tools have been selected within a particular institutional context because such a context allowed or prohibited the adoption of alternative approaches.

Further, policy choices are fundamental events that are hard to analyze without recognizing the importance of temporal sequences and the unfolding of events over time (Mahoney and Rueschemeyer 2003). Adopting strategies of governmental intervention represents sequential adjustments of policy to increased implementative capabilities, previous experience, and new demands. The selection of policy alternatives is not a static occurrence that takes place at a fixed point; rather it is a process that develops in time. Distinctive institutional configuration that affects alternative policy strategies is determined by institutional choices made early in the development of policy. This study revealed that the extent and the success of the introduction of flexible tools were shaped and constrained by the nature of the institutional practices that developed over time in the two countries.

Finally, historical institutionalism is concerned with specifically examining the way in which political institutions influence or structure policy

process and ultimately effect political outcomes (Steinmo 2001). Thus, by analyzing cases and processes at a less abstract level, historical institutional analysis helps us derive lessons from experiences and speak to the concerns of the present. The explanation of why particular policy choices were adopted in particular countries leads to further investigations that move beyond the initial cases. Historical institutionalist studies, by grasping critical (historical) case details, can provide advice concerning contemporary choices and possibilities. Many of the conclusions drawn from the U.S. and Russian cases are, therefore, likely to be valid for other societies, including developed countries, transition economies, and other countries that express interest in the application of flexible approaches in public policy.

CONCLUSION: INSTITUTIONS, INSTRUMENTS, AND GOVERNANCE

The United States and Russia's experiences with environmental policy tools hold useful lessons for many countries as to how to adopt and sustain complementary systems of regulation, as well as how to integrate flexible approaches into the traditional system of direct controls. This book draws out lessons from an emerging set of practical experiences, guided by the logic that policy choices are not adopted and "implemented in an ideal, institution-free world" but strongly depend on the institutional context within a country (Andersen 1994, 27).

The findings of this study point to some important conclusions relating to the design of environmental policy. These conclusions provide a set of principles for the integration of various policy instruments into an overall policy process that will promote society's environmental objectives.

This book ultimately raises questions of feasibility of policy changes. Policy innovations tend to reflect extant rules, traditions, and procedures. The choice of policy tools is fundamentally a function of governance criteria that cannot be narrowed down to a straightforward technical exercise of matching instruments with particular policy problems. The adequacy and legitimacy of particular choices are bound up with political, institutional, legal, programmatic, and economic factors that operate in a particular country. This contributes to our understanding that policy tools constitute but one element within a broader context and are hardly ever adopted in isolation.

In many respects, such an instrument choice perspective continues to provide an analytically and practically useful way of thinking about governmental action and problems of governance. Analysis of policy instrument adoption is important for political and policy considerations. Dissatisfaction with the functioning of certain policy areas leads to a strong need for in-

sights into policy failure. A variety of policy failures can be understood as caused by gaps in knowledge about policy instruments, their performance, and the requisites for their adoption. Solutions to policy failure lie in the development and refining of an instrument theory, as well as a realization of this theory into a valid instrumental practice.

Understanding the design and implementation of policy instruments is intimately related to understanding larger governance processes. If governance means flexible administration favoring different strategies and increasing power-sharing among multiple policy actors from and outside the government, then the question of flexible tools introduction is all the more important. Analyses of governmental processes that focus on policy steering beyond traditional regulatory approaches and address the changing nature of governmental intervention provide a ground for understanding the dynamics of new governmental initiatives.

Governments around the world are gradually learning about policy reconfiguration and are introducing innovative approaches. A transition to the use of flexible policy strategies and a transfer of power to various actors within the economy and society signifies a switch from traditional modes of regulation. While traditional models of governmental action could be seen as a question of governmental policies or a resort to direct management or regulatory prescription, new models of governmental action are built around the recognition of the severe practical limits to what can be achieved with prohibition. The underlying assumption behind the new ways of policy formation and delivery is generating incentives and focusing on desired outcomes by providing economic and societal actors with greater flexibility for responding to policy concerns and encouraging innovation. The intent is to achieve governmental regulation, which empowers rather than coerces societal actors. New modes of governmental action should be intended as a comprehensive effort to pull together in a coherent framework successful policy experiences and generate support for reforms to improve public governance.

The discourse on improvements in public governance as a rule deals with such issues as effectiveness, efficiency, legitimacy, accountability, transparency, institutional capacity, and policy reinvention. This study of policy instruments introduction pertains to this discourse on the values and processes of good governance. Policy choices within the governance paradigm reflect to a large degree the quality of governmental performance, including the ability to adopt new societal objectives and the means to approach them. Policy reinvention, when applied to governance aspects, should be based on a complex scheme of actions, and higher standards should be met to develop effective, efficient, and legitimate modes of intervention. However, policy action should also be based on realistic expectations and understanding the instrumentalities of attaining governance goals.

First, to examine whether the type of governmental intervention is effective and efficient requires us to consider policy comprehensiveness. A clear set of outcome objectives and the means to achieve them should come as a result of a full consideration of regulatory alternatives and increased attention to policy, institutional, organizational, and operational detail. The diversification and sophistication of policy instruments serve as an illustration of a commitment to improving effectiveness and efficiency of policy design and implementation. Creating and applying a variety of incentive-based instruments that provide flexibility to the regulated community and reduce the societal costs of dealing with social problems help streamline policy decisions and increase policy effectiveness.

Second, the capacity of governmental institutions is a crucial factor in the development and delivery of policies, in building conditions for economic progress and social cohesion, and ultimately in good governance. A reliable institutional structure, well-established coordination mechanisms, and an ability to make credible decisions characterize strong governmental capacity and are essential for policy consistency and improved management systems of government. Increasing government's ability to produce good policies requires increasing institutional capacity, which in turn strongly depends on the knowledge of past institutional and organizational arrangements, practices, and experiences. Governmental actors need information on how policy choices performed in the past and what factors affected past policy decisions in order to design and implement superior initiatives in the future.

Further, achieving maximum policy results and accomplishing collective goals demand not only improvement in the structure and principles of government. Good governance requires policy transparency through stakeholder engagement and participation. A systematic attention to and use of incentive-based and inclusive processes, and finding appropriate ways to engage and consult with the regulated community, citizens, and partners present enhanced opportunities to realize policy changes, and strengthen the links between government and society. By opening an opportunity to the economic and societal actors to be more active participants in policy, the government also increases the prospects that nongovernmental actors will bring innovative approaches to government's attention. Incentive-based approaches and voluntary schemes can increase the efficiency of societal responses to indicators of the need to change behavior and reduce negative impacts on the environment. Developing policy networks and increasing power-sharing can lead to a systematic change and improvement in policy performance through fostering communication, innovation, and regulatory reinvention.

Such aspects of good governance as effectiveness, institutional capacity, and transparency, all affect policy design and implementation practices and are critical for improved policy performance. However, the major principle

that inspires all these rationales is an accountability principle. Accountability traditionally entails explicit understanding that governmental actors and institutions are accountable for their decisions and performance. Accountability is a key factor to ensure that the power of governmental actors is used appropriately and in accordance with the public interest. At the same time, policy accountability should be viewed as a two-way street, where private entities and the public are also liable for their actions and act in accordance with policy guidelines and principles. Policy efficiency and policy capacity to achieve desired results depend not only on public participation in policy decisions and their approval of policy direction, but on the realization of policy aspirations through compliance with the course of action that both government and societal actors agreed on. While many traditional accountability relationships are still in place in many countries, they may need to undergo change to offer more flexible channels of policy delivery and compliance, improved reporting on results, and integrating policy information into the program, statute, and regulation development processes.

Initiating policy changes, reinventing the modes of governmental intervention, and achieving results through flexible regulations in environmental policy provide major opportunities for improving policy performance in other policy areas. Innovative flexible instruments may serve as a clear sign of a transition from government to governance by embodying efforts by the state to share its governing capacity through the creation of incentives and voluntary schemes for the regulated community to reduce its negative environmental impacts. Flexible instruments may shift a focus from standard-setting toward building mechanisms needed to achieve policy integration, along with dissemination of innovative approaches to other policy areas. This does not suggest a blanket solution for all policy areas. Instead, this advocates the provision of analytical and supportive frameworks, within which policy and decision-makers in different policy areas can explore innovative approaches appropriate for their respective fields to capitalize on regulatory traditions, practices of good management, and professional expertise.

A discourse on policy instrument design and application within the framework of governance presupposes a multitude of further lines of inquiry. How can the legitimacy of governmental interventions through the use of flexible instruments and instrument combinations be enhanced? How does the role of judicial, societal, and economic institutions influence instrument choice? What are the additional policy networks and actors that are created through the use of flexible policy tools? How can these networks be better managed?

Answering these questions would require improving our understanding of the determinants of legitimacy, effectiveness, and the public interest, as well as employing superior analytical approaches to explore the framework

of governance processes and practices for instrument adoption and implementation. Because theories of governance draw on a number of disciplinary perspectives and operate at different levels, a comparative and historical analysis highlighting the development of political and societal institutional contexts in which political and policy changes and struggles unfold can contribute to improved understanding of governance. Other factors influencing such frameworks could potentially include heightened attention to multidisciplinary research, consideration of demands to increase policy coherence and deal with the mounting complexity of legal obligations and economic developments, and an acknowledgment that policy instrument use is increasingly affected by the international and global dynamics.

For instance, the global climate change policy may benefit from investigating potential institutional configurations and instruments that can be adopted by individual countries or multilaterally to reach the goals that may be developed in later policy approaches. The formation of stable institutions and frameworks appears to be important and logically preceding the choice of a particular policy measure that can be altered within years (Stavins 1997). While it is difficult to attain agreement about any specific set of instruments internationally because such approaches would create severe limits on individual nations' domestic policy choices, within the context of flexible approaches, participating countries can develop appropriate domestic institutions and policy instruments. Therefore, it is important to consider temporal patterns for developing institutions that can ultimately implement new policy approaches. As institutions develop and as more is understood about the advantages and costs of dealing with a policy issue, there might be a transition toward more ambitious goals achieved with more sophisticated policy tools.

The importance of the relationship between policy instrument adoption and governance is a question about relevant governance mechanisms, which are supposed to manage and reflect on the development of particular institutions and instruments. Thorough examinations of contexts within which policy tools are adopted are central to the design and application of effective instruments and, ultimately, to the achievement of legitimacy, effectiveness, and accountability that characterize good governance. Recognizing that policy instrument choice itself is an essential part of reinventing government and achieving good governance carries both great potential and a challenge for instrument-based theory in the years to come.

Notes

CHAPTER 1

1. Flexible instruments are incentive-based tools that usually provide a choice in compliance for the regulated entities. Flexible instruments include economic instruments and informational instruments, as well as intermediate types, such as voluntary agreements, reflexive law, liability rules, audits, insurance, and so on. An extended discussion of flexible instruments will follow in this chapter and subsequent chapters as well.

2. While nonintervention by government is also considered to be a policy instrument (Anderson 1977), the "choice approach" suggests that some form of government intervention is justified (Vedung 1998).

3. The "borrowing" of the U.S. environmental regulatory and flexible techniques has been widely studied (Orts 1995). An export of environmental impact assessment and environmental auditing techniques in the late 1980s to Europe (UK) is just one example (Shillito 1994). Countries of the post-communist block that are given attention in the literature are Eastern and Central European states, rather than the CIS states (Sterner 2003).

CHAPTER 2

1. In the 1960s, Crocker (1966) and Dales (1968) analyzed the possibility of establishing marketable pollution permits to assign abatement responsibilities to polluters. In 1972, Montgomery found proof for the cost-effectiveness of such a system. Much of the literature on incentive-based tools that followed can also be related to Coase's (1960) seminal work on the market bargains in the externality between polluters and sufferers.

2. The starting point for such a classification was the works of Etzioni (1975) and Van der Doelen (1989). Etzioni explicitly differentiates between three kinds of power: coercive, remunerative, and normative. Van der Doelen makes a distinction between policy instruments and refers to them as legal, economic, and communicative tools (Van Der Doelen (1989) in Bruijn and Hufen 1998).

3. This study treats regulation as governmental intervention, planning, management, and guiding. Command-and-control is referred to as "direct regulation."

4. Precisely because of this choice, such instruments may not be a desirable option for many governments. If regulated entities are given a choice of polluting and paying for it, the environmental objective, which is pollution reduction, may not be met. In addition, due to the limited coercive power, it is very important that economic instruments be applied precisely. However, knowledge and information about the targets are not always sufficient.

5. Courts have a law-defining power, whereby they can overturn the decisions made by governmental agencies, thus structuring or redirecting the course of a policy or a regulation (McSpadden 1995).

CHAPTER 3

1. This book gives particular emphasis to the control of industrial sources and the attempts to streamline air policy. Air quality policy serves as a good case for the exploration of flexible instruments because it was an arena in which first flexible instruments were introduced early on, and a variety of flexible instruments developed over time.

2. As emission standards grow stricter and stricter, it becomes increasingly expensive to eliminate every additional unit of pollution. Allowing plants to reduce emissions at the points where it is less expensive to do so would enocurage a more cost-effective approach to abatement.

3. To continue operating older facilities rather than investing in new ones may be environmentally detrimental. The fear of the NSPS limitations on new sources may prevent plants building new facilities. Integrated permitting may allow meeting an overall emission limitation, while adding flexibility.

4. It is important to mention that the law defined "stationary source" as any building, structure, facility, or installation that emits or may emit any air pollutant within an existing plant (Clean Air Amendments 1970).

5. Although the council was publicly financed, its meetings were closed to public. Because of this secrecy and through the initiative of Representative Dingell of Michigan, the council was eliminated (Hays 1998).

6. The statute listed radioactive pollutants, cadmium, arsenic, and polycyclic organic matter [42 U.S.C. § 7422(a) (Supp. 1977)].

7. "Generic bubbles" are state-level analogues to the federal bubble policy, in which bubbles could be approved by the state so that EPA review of individual bubble proposal would not be necessary.

8. Banking and trading, however, were discontinued after 1987 when all leaded gasoline was required to meet the final concentration limit (U.S. EPA 2004a).

CHAPTER 4

1. The Senate Public Works Committee and its Subcommittee on Air and Water Pollution held 33 days of hearings with 6,400 pages of testimony from 170 witnesses and 470 written statements. The House Public Works Committee held

38 days of hearings with 294 witnesses heard and 135 written statements (Lieber 1975).

2. Industry challenged the strict EPA regulations. Trade associations and businesses pressed more than 150 suits and in more than 2,000 cases permits were contested in adjudicatory proceedings (Marcus 1980).

3. Initially, compliance generally meant an installation of required technologies. However, such data would not say anything about actual improvements in water quality. Only recently has the EPA announced a shift of its programs away from compliance with individual discharge permits and toward attainment of water quality.

4. A category of pollutants between conventional pollutants and toxics.

5. Testimony of Thomas Jorling, Assistant Administrator of the Environmental Protection Agency for Water and Hazardous Materials.

6. The program had its genesis in the EPA's August 21, 1978, proposed Clean Water Act rule-making (43 FR 37078, 1978). The regulation was published in final form on September 26, 1984 (49 FR 37998, 1984).

7. In 2000, states assessed nineteen percent of the nation's total river and stream miles; forty-three percent of its lakes, ponds, and reservoir acres; 36 percent of its estuarine square miles; and ninety-two percent of Great Lakes shoreline miles. States reported that sixty-one percent of assessed river and stream miles, fifty-four percent of assessed lake acres, forty-nine percent of assessed estuarine square miles, and twenty-two percent of assessed Great Lakes shoreline miles fully support the water quality standards evaluated (U.S. EPA Water Quality Report 2000).

CHAPTER 5

1. Socialist competition was a competition between enterprises and individuals in industry, agriculture, schools, hospitals, and so on. While the achievement of the state plan was the major goal, employees and work groups put extra effort to achieve superior results. The rewards were material, such as money and goods, and moral, such as diplomas, honorary lists, and photos placed on the "Boards of Honor."

2. Industrial groups were neither fully engaged in profit making nor deferential to power interests of the party leadership. They mostly performed two functions: production and maintenance of elites through the use of economic levers (Jancar 1987). Soviet leadership strived for economic growth not only because the military machine required it, but also because its rationale for power was that it was better able to provide conditions for economic development that were equitable, less prone to fluctuations, and more goal-oriented than capitalist economies (Nove 1982).

3. For example, state expenditures on environmental protection were to be compared with the theoretically calculated savings to the national economy from lowered morbidity rates, improved agricultural yields, and so on (Fedorenko and Gofman 1984).

4. Soviet experts and scholars insisted that if material incentives were to work, their size had to be increased in order to constitute a real incentive (Rozovskii 1981). Moreover, the dispersed character of the award and bonus system impeded its adequate implementation (Danilenko 1989).

5. Environmental initiatives can certainly be attributed to the Chernobyl accident. However, initial political actions to create an independent environmental agency at the Union level were outlined in the Joint Resolution of the Central Committee of the CPSU and the USSR Council of Ministers "On Measures to Further Increase the Role and Strengthen Accountability of the Councils of People's Deputies in the Acceleration of Socio-economic Development proposed at the XXVII Congress of the CPSU" (USSR Collection of Resolutions 1986).

6. While the Law on Environmental Protection signed by Boris Yeltsin in 1991 incorporated a provision for pollution charges, it remained very general and declarative in its nature. Developed by Professor of Law Viktor Petrov, it established principles, including citizen rights to a healthy and safe environment, but divided the responsibility between the various levels of government.

7. The introduction of pollution charges was closely tied with the system of environmental funds established in 1989–1991 in accordance with the Resolution "On the Fundamental Restructuring of Environmental Protection in the Country" (1988).

8. Minpriroda's headquarters in Moscow set uniform procedures for and coordinated a network of subordinate agencies located in the capital of each of the federation's eighty-nine regions or provinces (R.F. Governmental Regulation N943, 1994).

9. There was an important difference between emission charges and taxes. First, while the collected taxes would be allocated into federal or regional budgets, the money from charges was nonbudgetary and earmarked through the system of environmental funds for environmental programs and projects. Second, emission charges were not considered a part of tax expenditures by an enterprise (R.F. Ministry of Finance 2004).

10. According to the chairman of the Department on Economic Approaches to Environmental Protection of the Ministry on the Economic Development V. Gavrilov, ninety-seven percent of payments were collected from charges on thirty pollutants, while seventy percent of payments came from charges on five pollutants (Mescherin 2004).

CHAPTER 6

1. In 1972, the USSR Supreme Soviet adopted the RSFRS Water Code (USSR Proceedings of the Supreme Soviet 1972).

2. Maximum Allowable Concentrations were established for 2,679 pollutants.

3. The R.F. Water Code can be viewed as a foundation for the entire Russian water legislation because it has many references to other laws, decrees, and normative documents issued at federal level, which specify and regulate the application of federal legislation to any particular case of jurisdictional relations. The total number of references to other acts is over thirty.

4. The Ministry of Environmental Protection was later reorganized into the State Committee on Environmental Protection (R.F. Presidential Order 1996), and ultimately eliminated in 2000 (R.F. Presidential Order 2000).

5. The 1996 Governmental Resolution listed fourteen ministries and committees responsible for the development of water policy in the country. While policy inputs from multiple agencies may be crucial in decision-making, especially in "ecologization" of many other policy fields, reaching a timely decision may suffer.

6. See, for instance, Rules on Protection of Surface Waters (State Committee on Environmental Protection February 21, 1991); Sanitary Rules on Protection of Surface Waters from pollution (Ministry of Health 1995); Zones of Sanitary Protection of Water Sources (Sanitary-Epidemiological State Committee 1995); and others.

7. More than 1,300 standards, Maximum Allowable Concentrations, were established for different kinds of water pollutants. Water bodies were divided into different classes: Category 1: Water bodies used for household/drinking water purposes; Category 2: Water bodies used for recreation purposes; and Category 3: Water bodies used for fishing purposes (R.F. State Committee on Environmental Protection 1991).

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