THE UNIVERSITY OF CALGARY

Hitting the Green Wall:
Sustainable Development in Canada

by

Ronald L. Hallman

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE

DEGREE OF MASTER OF ARTS

DEPARTMENT OF POLITICAL SCIENCE

CALGARY, ALBERTA

SEPTEMBER, 1996

THE UNIVERSITY OF CALGARY

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Hitting the Green Wall: Sustainable Development in Canada" submitted by Ronald L. Hallman in partial fulfillment of the requirements for the degree of Master of Arts.

Supervisor, Dr. Roger Gibbins, Political Science

Dr. Anthony Perl, Political Science

Dr. Elizabeth Wilman, Economics

August 29, 1996

Date

Abstract

The emerging emphasis on debts, deficits, decentralization and the protection of the natural environment in Canada is facilitating a convergence of the principles of economics and environmentalism. And since public policy articulates a broad set of principles that guide in the development and implementation of programs, regulations, standards and projects, it follows that policies which offer a multi-pronged approach to achieving these inter-related ends will be useful. To this end, the use of appropriate economic building blocks—taxes, permits and charges, in addition to voluntary and regulatory mechanisms—in both environmental and non-environmental policy will foster the principles of sustainable development and will ensure an enduring federal role with respect to the environment. This convergence between economics and the environment speaks to the potential for reforming Canadian public policy for sustainability, a potential which provides our best defense against hitting the green wall in the future.

Acknowledgments

It is a singularly impossible feat to acknowledge the contributions of the full cast of characters who have added to my academic experience. That said, I wish to acknowledge those members of the University of Calgary who have allowed me to grope about in the world of academe while pursuing my various interests. Ted Horbyluk's first year microeconomics lectures sparked my initial interest in the field of economics, an interest which was more fully developed in Jim Gaisford's intermediate and advanced courses and in Elizabeth Wilman's environmental economics class. These individuals made what some have called "the dismal science" both understandable and relevant for me.

Upon completion of my BA in economics, Stan Drabek persuaded the Department of Political Science that I was a suitable candidate for the MA program, thereby allowing me to combine my understanding of economics with what I was to learn in the area of political science. Along the way, I benefited from the teachings of Anthony Perl, Keith Archer and my future supervisor, Roger Gibbins. These professors blended the rigorous of academic critique with a degree of flexibility that encouraged the learning process.

Dr. Gibbins explicitly demonstrated his confidence in me through a co-authorship opportunity, an experience which I shall not forget. I am grateful for the many hours which he spent, on my behalf, poring over the text which follows. I am also grateful to my colleagues in what we called "the Gibbins Group": Loleen Youngman, Jennifer Stewart-Toth, Butch Kamena, Sonia Arrison, Chris Gibbins, John Capelli and Michelle Honkanen, whose critiques were instructive and appreciated. Credit is also due Valerie Snowdon, Ella Wenzell, Judi Powell and Carolyn Andres in the departmental office for the ongoing support that they so willingly offer to all Political Science graduate students.

Finally, I would like to acknowledge the support of the Honourable Dan Hays, who

gave me an opportunity to combine my academic interests with practical employment experience in the Canadian parliamentary environment. As a member and past Chairman of the Senate Standing Committee on Energy, the Environment and Natural Resources, Senator Hays also permitted me access to valuable research materials that have enriched my understanding of environmental issues and the public policy process.

It is my hope that this thesis will contribute to our greater understanding of political science, the economy and our natural environment. I should also note that while many have contributed to the final form that this thesis takes, I assume full responsibility for the intellectual integrity of the arguments and the conclusions which follow.

R.L.H.

Dedication

This thesis is dedicated to those whose combined sense of family and friendship have meant so much to me. To my grandmother, Mary Bremner, whose wisdom and selflessness exemplify the most redeeming of qualities. To my father, Neil, whose optimism reminds us that our ability to withstand personal challenges is defined by the choices that we make. To Ross, whose unflagging encouragement and confidence in my abilities have been pillars of support for many years. To Anthony and Sharon, who demonstrate that true friendship withstands the dual tests of time and distance. To Ian, Mike, Trevor, Lori and Paris, for their friendship and humour. To my sister, Michelle, for always being there. To Deb, for lending me her heart, her ear and her shoulder. And finally, this thesis is dedicated to the memory of Anna, whose fierce determination and gentle spirit continue to inspire those who had the privilege of knowing her.

R.L.H.

Table of Contents

List of Tables

List of Figures

CHAPTER ONE

Hitting the Green Wall

Hitting the green wall refers to those moments when a portion of our natural environment collapses under the strain of the degradation deriving from uncontrolled, unsustainable development.[1]

"...in government and public life, there may not be any such thing as the right answer. There may, at best, exist a process whereby trends can be affected and the direction of social and economic behaviour temporarily influenced."
- Felix G. Rohaty, 1982[2]

Introduction

In recent years, the world has witnessed a sea change in the attitudes demonstrated by individuals and their governments towards the natural environment. While environmentalism is no newcomer to the public policy arena, an increased level of public concern for environmental issues (OECD, 1991; GOC, 1994c; Nevitte & Kanji, 1995; Pal, 1992) has fueled its steady upwards climb on political agendas—both in Canada and abroad.[3] Paradoxically, while the domestic and international stakes associated with environmental protection appear to be rising, polls also show that during the period 1988-1995, public policy priorities related to unemployment, the national debt, economic growth and national unity still out-distanced those related to the environment (Peters, 1995: 96).

Add to this the emerging political climate in Canada which, particularly since the narrow federalist win in the Québec referendum on sovereignty in October of 1995, is increasingly urging a move from a strong, interventionist central government to a more

---

[1] I have chosen to develop the "Green Wall" in this way to identify the barriers to sustainability that exist and to suggest that we are likely hitting the wall, in many ways, every day. I will develop the argument that our ability to avoid hitting the green wall in the future will be shaped by our ability to develop public policies which foster not only short-run pollution abatement, but also long-run sustainability.

[2] From his commencement speech to the graduating class of his alma mater, Middlebury College, in Vermont in May of 1982, reprinted in William Safire. 1992. Lend Me Your Ears: Great Speeches in History, New York: W.W. Norton and Company, p.930.

[3] In general, this increase in concern has been attributed to four causes: value shifts which arise from the "new politics" associated with society's shift from materialism to postmaterialism, economic factors, health considerations, and cognitive mobilization. For an analysis of each of these factors, see Nevitte & Kanji, 1995.

decentralized federation. Despite the fact that environmentalists have benefited in the past from federal standards and regulations, they have often pursued an agenda which supports driving decision-making down to lower levels of influence (Hallman & Honkanen, 1995). Now, as the federal government appears poised to transfer jurisdictionally contested powers to the provinces, it appears that environmentalists will claim a "small is beautiful" victory. Ironically, though, the ability of Ottawa to act as a champion of environmental interests in a more decentralized state appears uncertain—a fact which may render environmental management in Canada less, rather than more, effective. All of this suggests a role for public policy makers, to whom the challenge necessarily falls to balance political, economic and social issues with those of the environment.

Hitting the Green Wall examines a key issue in the Canadian public policy arena. It embraces, through a review of published environmental, economic, and political science literature, as well as through the examination of both environmental and non-environmental legislation, the need to reform Canadian public policy for sustainability. Central to this is the traditional tension between the proponents of economics on one hand, and the proponents of strict environmental regulation on the other. But of equal import to this research is the consideration of an enduring role for the federal government with respect to sustainability as the Canadian political environment continues to evolve. How will the tenets of environmentalism be manifest in the new Canada? Who will speak on behalf of Canadians concerned with regional, national and international environments if the trend towards transferring powers from Ottawa to the provinces continues?

An examination of existing and possible strategies for protecting the environment will demonstrate that both market mechanisms and regulatory mechanisms can be employed to advance the goal of pollution control. Given the emerging proclivity of Canadians and Canadian industry to shrug off the patriarchal hand of an interventionist state, however, it may be that market mechanisms will be better suited to withstand the new tendency towards decentralization. Furthermore, I will argue that an enduring federal role in managing our

natural environment may be best served by buttressing the economic building blocks advocated for use in environmental policy with a more inclusive framework for Canadian public policy in general.

To this end, I will argue that our traditional focus on environmental protection has been too confined to *environmental* legislation and that we would benefit from paying greater attention to the vastly greater body of non-environmental legislation which has, nonetheless, massive implications for the environment. Insofar as the focus on debts and deficits, and the trend towards decentralization present particular challenges to the hard won victories engendered in federal standards in all policy fields, Ottawa will need to devise other strategies for achieving an enduring federal presence in matters related to the environment. I will conclude that a dual strategy of using economic instruments to encourage pollution abatement and reforming the broadest possible swath of public policies for sustainability provides the greatest potential for Canadians to deal with recent changes in the political environment while taking concurrent steps to achieve long-run sustainability.

Conceptualizing the Green Wall

Financial analysts, commenting on the debt loads of countries such as Canada, the United States and others have coined a phrase for that point at which a country's economy collapses under the strain of debt servicing deriving from uncontrolled, unsustainable government spending. They call it "hitting the debt wall." If we liken the environment to the economy, with a finite amount of capital (air, water, land) that can be "allocated," then an analogy about the future of the earth's ability to sustain life as we know it is brought into sharp relief.

Economic growth and development that proceeds unchecked and without consideration of the natural environment cannot be sustained (Gorz, 1980; Gordon and Suzuki, 1991). At some point, the expenditure of environmental capital becomes irreversible and mankind's ability to "manage" that portion of the environment is eclipsed by the natural consequences of degradation. "Hitting the green wall" refers to those moments when a portion of our natural

environment collapses under the strain of the degradation deriving from uncontrolled, unsustainable degradation. Each time a health risk for humans becomes critical, a species of plants or animals disappears, a piece of previously arable land becomes unusable, or a water supply dwindles through desertification, we can think of ourselves as "hitting the green wall."

The foregoing examples are not mere Orwellian prophesies—they have occurred in the past, are occurring today, and are likely to continue in the future. More than ever, policy-makers the world over are faced with the challenge of integrating a vast range of information to draft legislation which will take into account social, economic and environmental aspects. Whether we will continue to hit the green wall or whether we will learn to balance human social and economic needs with those of the environment depends largely upon the ability of governments to clarify political priorities and formulate public policies that are consistent with the principles of sustainable development.

More radical environmentalists might suggest that economic growth is explicitly contraindicated for environmental protection. In response, economists speak of the potential to "minimize externalities" and to "internalize environmental costs" through the development of greener public policies. As such, they argue that environmentalism and economic development need not necessarily be anathema to each other. But the enduring reality of scarce resources also suggests that environmental issues will continue to compete with economic and social issues for a foothold on the political agenda. Given the growing list of environmental concerns, government fiscal realities, stagnant real family incomes and a fiercely competitive business climate it is by no means a certainty that individuals, firms and governments will be keen to sacrifice potential economic gains in support of environmental initiatives. This will be especially true when environmental initiatives are not ranked high on a perceived list of public priorities.

Many would characterize environmental protection as a luxury (Pal, 1992: 271), affordable only during periods of economic prosperity. Bakvis and Nevitte (1992: 162) acknowledge that public support for environmentalism will often "depend greatly on the state

of the economy." This view argues that

> at the aggregate level, a downturn in the economy could easily result in the elevation of economic concerns over environmental ones. On the other hand, environmental issues are likely to remain at the forefront of the public agenda as long as comfortable economic conditions prevail. At the individual level, the argument is that those who are financially well off are more likely than those in low income groups to be both concerned about and actively engaged in the environmental movement (Nevitte & Kanji, 1995: 87).

That said, the stalling of Western economies since the late 1980s gives cause for concern among environmentalists. It also suggests a need for an enduring policy role for governments with respect to protective environmental measures. The very fact that economic priorities have the potential to run roughshod over those of the environment speaks to the need for incorporating sustainable development principles into the vastly greater bulk of non-environmental legislation if sustainability is to remain a priority, particularly if federal environmental powers are devolved to the provinces in the future. At this time, it is useful to articulate a clearer sense of what is meant by the terms 'sustainable development' and 'public policy,' concepts which are central to the chapters which follow.

Understanding the Concept of Sustainable Development

It is becoming increasingly clear, from both an ecological and environmental perspective, that the present order is not sustainable in the long term. It is now widely recognized by individuals, businesses and all three levels of government that there is a strong correlation between the decoupling of the world economy from environmental and societal values and problems such as environmental degradation, deforestation, desertification, soil depletion, climate change and species extinction.

Sustainable development, in general terms, can be understood as an attempt to integrate economic and environmental concerns, a good fit given that "both the terms 'ecology' and 'economics' derive from the Greek word oikos, meaning home or household" (Chant, McFetridge & Smith, 1990: 82). In Bill C-83, an *Act to Create a Commissioner of the Environment and Sustainable Development within the Auditor General's Office, 1995*, the federal government more fully articulates an understanding of sustainable development. Essentially, eight principles are at the core of this important concept:

- the integration of the environment and the economy,
- protecting the health of Canadians,
- protecting ecosystems,
- meeting international obligations,
- promoting equality,
- an integrated approach to planning and making decisions that takes into account the environmental and natural resource costs of different economic options and the economic costs of different environmental and natural resource options,
- preventing pollution, and
- respecting nature and the needs of future generations.

But defining sustainable development is only a first, tentative step. Of greater import is the manner in which the principles of sustainable development are reflected in public policies. Given the inherent complexities which characterise environmental and economic debates, it is important to clarify the key terms, at least as they are to be understood in this research, at an early stage.

To this end, Howatson (1994: 3) offers a useful description of the relationship between pollution prevention, environmental protection and sustainable development:

> Pollution prevention denotes any action or set of actions taken to prevent the release into the natural environment of substances harmful to human health, ecosystems or productive resources, man-made or natural....Environmental protection includes pollution prevention but also extends to such activities as conservation of wildlife, maintenance of healthy stocks of fish and forests, and prevention of agricultural soils erosion. Sustainable development, in turn, includes environmental protection but focuses upon the need to ensure that human societies and economies are compatible with a healthy environment. "Human well-being within ecosystem well-being, extending through time" broadly summarizes the meaning of sustainable development.

Key sustainabilty issues facing Canadian public policy makers include the use of our natural resources; pollution prevention and waste minimization; integrating environmental and economic goals; international cooperation in achieving environmental security; and making biodiversity an appropriate national objective. In this research, the strategy of employing economic building blocks in the pursuit of both short-run pollution objectives and broader, long-run sustainability goals will be explored.[4]

---

[4] Note that this research sets aside the issues of land conservation and species preservation. Both of these are important aspects of environmental protection in general and are therefore included within the concept of
continued on next page...

The Sustainable Development "Revolution"

The period since 1987, the year in which the WCED released Our Common Future, can be described as a period in which western economies experienced a sustainable development revolution. Bernard Crick (1993: 268) defines a revolution as something which is "...aimed at far more than a change of government, rather to create a new regime, to transform many basic social institutions and also basic values...triggered by inherent contradictions in the ideology of the ruling class." Insofar as sustainable development encourages us to question neoclassical economics and our tendency towards largesse and waste, the term "revolution" is certainly not at odds with a paradigm shift in values.

> Popularized through the World Commission on Environment and Development (WCED), broadly endorsed in Canada in the aftermath of the deliberations of the national Task Force on Environment and Economy, and incorporated in policy statements such as the federal Green Plan and in certain statutes, sustainability is now widely regarded as a criterion against which various developmental initiatives should be assessed (Benidickson, Doern and Olewiler, 1994: 20).

It should be noted, however, that the application of the tenets of sustainable development to the policy process presents significant challenges to decision makers. Indeed, the WCED's endorsement of "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (1997: 43) has been interpreted to mean any manner of things. As a guiding principle, though, the concept of sustainable development stands up well in both the environmental and the economics literature and has become an important component of Canadian public policy, including the North American Free Trade Agreement and the environmental side agreement.[5]

Sustainable development favours a global approach to life with the focus on ecosystems at the regional, national and international levels. It encourages, at least at the conceptual level, the erasing of "lines on maps" and the demarcation of political territory. But even as sustainable development continues to enjoy increased salience in contemporary society, so too

---

sustainable development. For this thesis, however, we will concentrate on the need to curb pollution and encourage sustainable development.

[5]For a discussion of the environment with respect to NAFTA and the environmental side agreement, see Library of Parliament, December 1993.

is its potential constrained by the social, political and economic factors at play. In this era of economic malaise and pronounced unemployment, Crick's warning (1993: 269) with respect to the USSR's revolutionary move to a free economy is instructive.

> Small wonder that new regimes come under threat when they have to call for continued economic hardships, perhaps even more than before, to rebuild from the mistakes of the past. The workers have heard all that before. Disillusionment can come quickly,...especially when the greatest price of transition...is something as fundamental and hitherto unexperienced as unemployment coupled to the rising price of necessities. Apart from the risk of violent death, there is no human circumstance that can so discredit a regime and cause so many of its inhabitants to drop out from, despise and turn against civil society, as continued mass unemployment.

The above serves fair warning that domestic economic and employment issues may tempt us to sway from our goal of sustainability, particularly when such a revolutionary shift requires the allocation of associated costs. This supports the central thesis of this research —that Canadians would be well served to buttress existing and proposed environmental policies with greener non-environmental strategies.

Public Policy: Developing a Common Language

It is instructive at this point to outline what is meant by the term "public policy" in the context of this research, in order that the following chapters will be supported by a common language. Borrowing from the work of Leslie A. Pal (1992: 2), we can define public policy as "a course of action or inaction chosen by public authorities to address a given problem or interrelated set of problems." Note that an elected legislature may be the origin of a particular policy but, increasingly, authority may also be delegated to certain agencies.[6] Regardless of who crafts or monitors a policy on behalf of Canadians, all policies have a specific purpose. Public policies normally articulate a broad set of plans and principles that have been approved at senior levels of government in order to guide civil servants or delegated authorities in the development and implementation of programs, regulations, standards and projects (Howatson, 1994: 3).

---

[6] The CRTC, CBC, and CMHC are examples of "arms-length" agencies in Canada. The recent move towards agency structures in Canada's national parks system provides another, more controversial, example.

Public policy analysis focuses on the intent of the policy, the goals which it pursues, and the instruments chosen with which to pursue its objectives. As Leslie Pal writes (1992: 13), public policy is at the core of what elected governments do.

> In liberal-democracies, political parties compete for power on the basis of programs and platforms consisting of policies. Once in power, they are expected to refine and amend these proposals, implement them, and respond to new public problems as they arise on the agenda.

At a more basic level, the goal of public policy analysis is to make sense of those policies which are designed to create social institutions and which serve to mediate conflicting preferences respecting the allocation of scarce resources among individuals in a society (Pal, 1992: 13; Chant et al, 1990: 85). And if the role of the state is to achieve social goals, then public policy can be thought of as the framework in which those goals will be pursued. But it is also true that the "process" of public policy takes place in a much wider context than we might realize at first blush.

> Policy analysis cannot be everything—philosophy, social science, and natural science combined. On the other hand, as an activity that is central to democratic politics, it will be diminished if it closes its eyes to any part of the world of human knowledge and affairs.... While policy analysis remains a specialized field of application, nothing under heaven or on this earth should be beyond its interest (Pal 1992: 274).

Note too that while the imposition of strict regulations is a possible policy option with respect to environmental protection, so too is the pursuit of market mechanisms. Indeed, even a course of inaction can be described in terms of public policy if that inaction is deliberate. It is the source of the policy, then, and not its impact, which renders it a *public* policy.

It should be noted as well that there is nothing divine about particular public policy options. The development and analysis of public policy is one component of the political process and is as contestable as it is imprecise. To enhance the usefulness of our policy analysis, we will begin our discussion with a review of relevant theories, theories which will act as springboards for what is intended to be a rational presentation of environmental and non-environmental policy options. And while it is the *source* of the policy that determines whether or not it is deemed to be public in nature, it will be the *impact* of alternative policies to which we turn when we begin our analysis in later chapters.

In mediating conflicting preferences between economic growth and the environment, effective public policies will be those that provide a blueprint for fulfilling the expectations of the proponents on *both* sides of the debate. In this regard, it may be that while a tension exists between economics and environmental systems, they remain meshed and interdependent and that the principle of sustainable development helps to create a synergy between the two. The extent to which environmental and non-environmental policies might be adapted with a view towards achieving short-run pollution abatement and broadly based, long-run sustainability underpins the bulk of this research.

The Role of Government and the Left-Right Debate

Central to the politics of environmentalism are "the distributive effects of alternative policies and the degree to which governments should regulate the economic and social orders" (Hallman & Honkanen, 1995: 158), a debate that is typically framed as a left-right struggle. Environmentalists tend to support an interventionist state in pursuit of environmental protection, a view that runs counter to that of those who support the *laissez-faire* policies of the right. And while environmentalists assert that free market systems fail to produce even a minimum degree of social welfare, critics of green theory object to environmentalists' use of the "space ship earth" metaphor, arguing that it promotes a "false consciousness" (Cockburn and Ridgeway, 1979: 385). Environmentalism's assertion that we are "all in the same boat" says nothing about our relative positions in that boat.[7]

The assertion of "neutrality" within environmentalism is therefore called into question by its critics. Consider the distributive issues that would arise if world energy consumption was stabilized at a particular level. As Giorgio Nebbia writes in his preface to La Morte

[7] Carrying this critique further, it can be argued that while western industrialized nations languish in the luxury of the staterooms (industrialization), developing nations are frequently relegated to the filthy bilges located below the floorboards (poverty and underdevelopment) on that same boat. "Insofar as the developed nations have amassed their wealth and have achieved economic prosperity in a climate of technological advance, it is well and good for them to turn their attention to environmental challenges. For the less developed nations, however, fewer options exist. The relative costs of stopping or reversing the effects of environmental degradation in the third world are potentially crippling in comparison to those of western states" (Hallman & Honkanen, 1995: 158).

Ecologico (Bari, 1972):

> The real question would then be, however, how the available energy should be distributed globally. In arithmetical terms the solution would look something like this. The developing countries would have to have three times as much energy at their disposal as they do today; the socialist countries could by and large maintain their present level of consumption; but the highly industrialized countries of Europe and the USA would have to reduce their consumption enormously and enter upon a period of *contraction* (his emphasis).

To the extent that, even among the staunchest environmentalists, the acceptability of such an allocation would be unlikely in contemporary western societies,[8] it is clear that issues of distribution and ideological currents in the left-right debate are not trivial. The following discussion presents the left-right struggle in the context of "deep" versus "shallow" approaches to environmental management.[9]

The shallow approach attempts to resolve the question of whether one has moral interests as an individual or whether those interests arise as part of a greater whole. With respect to politics and environmental issues, the "left-right" struggle is often an extension of this debate.[10] Lawrence Johnson (1991: 245) asserts that this shallow approach to politics is unsatisfactory, cautioning that:

> politics of both the left and the right tend to be too preoccupied with Economic Man. We have being and interests that go well beyond those of hollow and fictitious Economic Man, and we live in a world of beings that are morally important. As well the left and right have their own characteristic shortcomings. On the right we have individualism and laissez-faire economics - with their trickle-down theory of wealth and trickle-up theory of austerity. Insofar as there is any concern for the general good at all, it is hoped that somehow the aggregation of individual efforts toward individual goals will promote the general welfare. However, the "invisible hand" that is supposed to promote the general welfare through individual strivings does not work effectively even in the restricted sphere of economics - and there are more than economic interests to be considered. It is well known that economic activities have disrupted our environment, as well as human life. There are holistic problems that require a holistic approach to solving. They need solving urgently, and cannot be solved on an atomistic basis. That, of course, is what the left keeps telling us.

---

[8]Note that individuals may locate themselves at different points along the left-right scale. This difficulty is further exacerbated given individuals' tendencies to adjust their relative location depending upon the nature of the specific issue being addressed.

[9]The reader is cautioned that these labels should not be interpreted as reflecting normative judgments about the approaches. The term deep does not imply a particular superiority or profoundness. Nor does the term shallow imply a sense of myopic inadequacy. Rather, the relevant literature offers each term simply as a label for a particular approach to understanding complex issues.

[10] Note that this application of the terms "shallow" and "deep" is somewhat different than the more conventional meaning reflected in the environmental literature, where "shallow" implies a focus on anthropocentric interests and "deep" implies a more biospheric approach. These more conventional understandings of the terms will be looked at more closely in the discussion of deep ecology, in Chapter 2.

That is, he rejects the right's atomistic approach and its faith in the invisible hand. To Johnson, *laissez-faire* policies have led to massive environmental degradation, and it is by no means certain that this trend will be reversed in the absence of government intervention and control. But while he postulates that all species—of which humans are merely one among many—are entities in and of themselves that have interests of their own, so too does he criticize the left's holistic emphasis and its "distressing tendency to see value *only* in terms of an encompassing whole" (1991: 246). For Johnson, it is not sufficient to speak of environmental protection to the exclusion of individual interests. Rather, it is likely that humans have moral interests both as individuals *and* as parts of a whole. This notion is captured in discussions of deep politics.

According to deep politics, neither the individual nor the whole can assume moral primacy all of the time. Instead, a multi-level, morally deep approach to environmentalism is required given the multi-level nature of environmental challenges. The goal of environmentalism in general, then, is to achieve a sustainable and just balance between the interests of humanity and those of the natural environment as a whole. Put somewhat differently, deep environmentalism suggests that we must consider the moral significance of *competing* interests and entities if we truly seek a balanced and just approach to environmental action. This presents a particular challenge to environmentalism which has, historically, been most comfortable on the left of the political and public policy spectrum. While issues of social equity and environmental justice [11] provide compelling anchors with which to ground environmentalism firmly on the left, it may be better served by shifting to the right and re-articulating its message in a manner which is more compatible with economic realities. Indeed, the social values of the political left are only instructive insofar as they are able to inform debate and influence policy.

In the current era of fiscal conservatism and decentralization, left of centre ideologies

[11] This is particularly true with respect to minority groups, who often offer "the path of least resistance" when environmental decisions are made and for whom access to decision-makers is typically absent.

stand to lose momentum and see valuable gains reversed if they are unwilling or unable to adapt to contemporary political, economic and social conditions. And whereas environmentalists need not abandon their core values and principles, it is suggested that the selection of alternative methods, methods which provide economic incentives for pollution abatement and broadly based sustainable development, may offer a greater potential for achieving the desired end than does the "preaching" that has become stereotypical of the movement. Furthermore, the inculcation of environmental tenets in the broader array of non-environmental legislation may provide a degree of "green protection" against the vagaries and fluctuations of the economy and the political maneuvering that necessarily arises therein.

Framework for Analysis

This thesis examines the extent to which public policy can reconcile the principles of both economics and environmentalism in support of the principles of sustainability in Canada. It will address the equally unsatisfactory presumptions that economists are concerned only with profit maximization and that environmentalists are so eager to preserve the land, its water and air as to be blissfully unaware of the economic consequences of such a view. Much has been written about the ways in which "economic building blocks such as free market prices, private property rights, and a legal system which defines, delineates and protects these rights" can be utilized to achieve environmental goals (Block, 1990: vii). Furthermore, it may be that the use of such building blocks provides a better impetus for sound environmental activity than does direct and explicit government control.

Critics will be quick to note that the notion of using economic building blocks to protect the environment is not new. Indeed, the literature supports such a claim. What is different, however, is the political environment in which we are now operating. Whereas the thesis which follows would likely have been dismissed as an interesting abstraction twenty or thirty years ago, it is suggested that the receptivity of both environmentalists and economists to seeking common ground has risen in recent years. The ideological view which has dominated Canadian politics in the post-war years is fading. There is an emerging appreciation of the fact

that governments cannot afford to continue providing the full range of services that were once taken for granted. Indeed, it is no longer socially acceptable for our governments to spend millions of dollars on programs if expenditures exceed revenues. The current emphasis on the debt and the deficit reflects an appreciation of the effect, through the economy, that large, interventionist governments exert upon the lives of everyday Canadians. As governments turn to more cost effective and, in many cases decentralized, means of achieving social objectives, it makes sense to revisit the thesis that economic building blocks provide a powerful means by which we can achieve our social objectives. Command and control oriented, interventionist policies are no longer favoured by cash-strapped governments. Notions of economic instruments, tax reform and efficiency are no longer considered to be "out of step" with Canadian values. They also provide a public benefit in that they force firms to internalize the real costs of their activities by redirecting much of the current burden of regulatory transaction costs back to the private sector.

Equally important is the emerging appreciation of the effects of industrialized society's activities on the natural environment. Just as it is no longer socially acceptable for governments to amass large debts, so too is it unacceptable to pursue our objectives without considering the state of the natural environment. Like the focus on debt and deficits, sustainable development has captured the imagination of Canadians and has transformed the manner in which we practice politics in a way that few other contemporary issues have equaled. In fact, the pursuit of sustainable development has become a stated objective of the federal government. Economists now speak about the need for sustainable development, rather than urging "development at all costs." Similarly, the willingness of environmentalists, who previously criticized economic growth in general, to speak with proponents of free markets about sustainable development speaks to a profound shift in the way in which they view the world. It may also reflect their understanding that, as we shed the old paradigm of large, intrusive and expensive governments, new allies will be required in the struggle to protect the

environment.[12]

The emerging emphasis on debt and deficit, decentralization and the protection of the natural environment make this thesis both relevant and useful. These changes in the Canadian political environment are facilitating a convergence of the principles of economics and environmentalism. But even as centralized, deficit funded programs give way to more cost-effective, decentralized initiatives, so too does the influence of the federal government recede in the regions. Within the scope of environmental issues, the challenge of identifying an enduring role for Ottawa is by no means trivial. Here, it is suggested that if the appropriate economic building blocks—taxes, permits and charges, in addition to voluntary mechanisms—are put into place, then utility maximizing Canadians will act rationally and responsibly and the decline in federal regulatory control will be of little importance. In addition, whereas the federal government may surrender authority over certain programs to the provinces, they can certainly use those areas of jurisdiction over which they retain control to achieve desired national goals. Given the recent changes in the Canadian political environment, it will be concluded that by incorporating economic principles into both environmental policy and the broader volume of non-environmental legislation—which has, nonetheless, massive effects on the environment—an enduring federal role with respect to the pursuit of sustainable development can be maintained.

This line of thought, which supports the bulk of this research, will not satisfy those who shun capitalism in general and who use environmentalism as an instrument with which to attack free market systems.[13] Nor will it inspire those anti-environmentalists who are

---

[12] While the phrase "sustainable development" contributes greatly to debates related to the environment, it is not without its critics. To some, sustainable development is akin to sustainable growth, an application which is troubling to environmentalists. In addition, some would argue that sustainable development overemphasizes the importance and legitimacy of human needs over those of other species. Having said this, it is suggested that sustainable development is still the best phrase that we have at this time and that it is suitable for the purpose of this thesis.

[13] Nor will I attempt to placate these critics. While public systems are far from perfect, it is also true that strict, central planning has a lot of explaining to do with respect to its own environmental record. A sad but true example is presented in the case of communist Russia's devastating Chernobyl accident which caused the death of hundreds, the despoilation of thousands of miles of land and which continues to manifest itself in the

continued on next page...

concerned only with profit maximization in the short-run.[14] Rather, this research will simply argue that it is possible to use economic means in order to attain environmental objectives. Given the trend towards decentralization and the links between economic performance and environmental concern, the importance of reforming Canadian public policy for sustainability is likely to rise over time. This research makes a tentative first step in this regard.

Chapter 1 has attempted to provide a brief analysis of concepts upon which the following chapters will build. It will be useful to examine the basic principles of both environmentalism (Chapter 2) and economics (Chapter 3) before relating these concepts more directly to ways in which future environmental legislation might more fully embrace economic instruments to achieve short-run pollution abatement (Chapter 4) and long-run sustainabilty objectives (Chapter 5). The case study examination of the Canadian *Income Tax Act* serves as an example of how we might reform the broader base of Canadian public policy for sustainability in the future. Finally, I will conclude that a meaningful convergence of economic and environmental objectives is indeed possible and that our ability to take the lessons learned regarding economic instruments one step beyond that of environmental policies, to the vastly greater body of non-environmental legislation, provides our best hope of achieving sustainability and our best defense against hitting the green wall in the future.

---

form of cancer and leukemia in its survivors. In contrast, not one death occurred at Three Mile Island, the site of the worst nuclear accident in capitalist America's history.

[14] But neither should the proponents of this narrow view be categorized with economists, since economists view both the short- and the long-run as important. In an economic sense, the danger of being blinded by short-run gain is that ecological disaster severely limits the potential for growth, prosperity and profits in the future.

CHAPTER TWO

Environmental Imperatives

"Eco-systems work as systems: they may not work to our liking or produce results that we applaud, but they work."
- Leslie A. Pal, 1992

"In the days of the dinosaur, extinction was an act of God. Now, it is generally an act of mankind."
- Frances Cairncross, 1992

Introduction

Environmentalism as a conceptual framework suggests a concern for protecting, and conserving the earth's natural environment. In addition to its emphasis on physical features such as flora and fauna, however, contemporary environmentalism also embraces a concern for the artificial or man-made environment (Hallman and Honkanen 1995: 226). Thus urban problems relating to water, air, architecture and noise pollution are very much part of the environmental agenda, along with deforestation and the protection of wildlife, ocean mammals, and biodiversity. So too are a number of less visible issues, including chemicals in the food we eat, the thinning of the ozone layer and global warming. In short, the scope of environmentalism is very broad.

As the foregoing suggests, environmentalism is a complex phenomenon with far reaching social, economic and political implications. Insofar as it brings together a broad spectrum of values, behaviours and theoretical perspectives, environmentalism provides a moral imperative for protecting the natural environment.[15] In order to create a useful "jumping off point" for our discussion, it will be useful to develop the conceptual framework of environmentalism more fully.

The environmental movement encompasses a wide range of groups and organizations

[15] I will argue later that economics provides a financial imperative for doing so. The combination of environmentalism and economics, then, lends powerful credence to arguments in favour of reforming public policies for sustainability. We will return to this assertion in Chapter 3.

devoted to the pursuit of environmental objectives. Some have a very narrow focus and membership base while others pursue global objectives and recruit members by the thousands, even tens of thousands. Although not all have a political mandate, and while only a very few take the form of green political parties, virtually all are engaged in the political process to some extent in the pursuit of local, national, or even international environmental objectives. In this way, environmentalism provides a critical link between individuals and public policy.

A Deeper Sense of Ecology

As a movement, environmentalism has been described as "an expression of a deeper form of consciousness about ecology...an enhanced appreciation of systems and a higher sense of risk, with...a commensurate demand for safety and protection" (Pal, 1992: 271). Environmentalism demonstrates its deeper sense of ecology through two distinguishing features. First, it appears to attack Western society's reliance on the market system and "the ethic of economic growth." Indeed, many compelling arguments exist which seemingly buttress the view that economic growth and uncontrolled market systems bring us ever closer to hitting the green wall.[16] The second feature of environmentalism's deep sense of ecology is that it challenges our traditional understanding of politics and the political process. In particular, the "lines on maps" which demark sovereign territorial states often become of less import to those who are concerned with issues of trans-jurisdictional pollution. Insofar as this is true in municipal, provincial, federal and international arenas, environmentalism presents an interesting challenge both to the politics of federalism here in Canada and to our relations with other nation states.

Public opinion data point to a shift away from traditional anthropocentric attitudes which emphasize technological advancement and continuous economic growth. This "new environmental paradigm" (Dunlap and Van Liere, 1979, Kanji and Nevitte, 1995) suggests that

---

[16] As I will argue in Chapter 3, however, it is often the *absence* of key markets which precludes sound environmental management. Further, economic principles—such as the assignment of property rights and the creation of markets for particular natural resources—offer powerful insight into the means by which public policies may be reformed to encourage sustainability.

what is required is a biocentric view of the world. Central to this line of thought is "a concern with maintaining a long-term sustainable relationship between man and his environment on this Earth" (Macdonald, 1989: 19). A biocentric view allows us to identify several "values" that are consistent across all branches of an environmental consciousness. These values speak to the nature of environmentalism in general and provide normative guideposts which can be used to think about the "good life" and to evaluate the world (Hallman & Honkanen, 1995). Thus, the rise of an environmental consciousness may be thought of as a response to the realization that mankind's exploitation of world resources over time have been anything but benign. As Porter and Brown (1991: 2) write:

> the major components of the biosphere, including the atmosphere, the oceans, soil cover, the climate system, and the range of animal and plant species have all been altered...The byproducts of economic growth—the burning of fossil fuels; the release of ozone-destroying chemicals; emissions of sulfur and nitrogen oxides; the production of toxic chemicals and other wastes and their introduction into the air, water and soil; and the elimination of forest cover, among others—cause cumulative stresses on the physical environment that threaten human health, habitats, and economic well-being.

This realization has been built upon an increased scientific appreciation of global environmental conditions. Implicit in this line of environmental thought is a sense that the imperative of ever-increasing economic growth, espoused by neoclassical economists, flies in the face of the earth's long-run requirements for survival. We will return to this point in Chapter 3.

"Systems" Thinking and an Environmental Ethic

The traditional anthropocentric view holds that humans represent the apex of the evolutionary pyramid and that we therefore enjoy priority over other species. The emerging environmental ethic increasingly suggests, however, that the human species is just one among many in the earth's biosphere—all of which, including animals, ecosystems, and inanimate objects, "are imbued with inherent value" (Baker, 1992: 5). Baker also notes that the environment can be seen as "a set of integrated biotic systems, each with its own equilibrium of energy transfers amongst living species and inanimate forces, its own carrying capacity, and its ability to sustain itself, barring human interference." She continues, noting that:

> we must change our attitude to the land, abandon our view of it as our property and as merely a resource. We should extend our social conscience to embrace the land so that we think of it as part of an expanded community of which we, like lakes and plants and birds, are all alike members, just as we

> now think of ourselves as members of a human social community.

This biocentric paradigm, while acknowledging the remarkable characteristics which humans demonstrate in relation to other animals, reminds us that mankind operates within ecological constraints and that ecological laws are inescapable, even for humans (Dunlap, 1980:8).

These ecological constraints are imposed upon society by virtue of the fact that humanity exists within a series of intricate systems, systems in which humans co-exist with the natural environment. As Macdonald (1989: 19) writes, this environmental paradigm assumes that "everything is connected to everything else and that the part can only be understood in the context of the whole....[N]ature is not a machine separate from humanity...[it is] a living organism, an image in which humans form an integral part of a universal whole that is an ongoing process of growth and evolution."

Within these systems, policy interventions which fail to acknowledge the presence of and address the complex workings of the ecosystem often upset nature's balance and lead to unintended, undesirable consequences. Both economics and ecology involve the study of

> unintended consequences in interdependent systems. Both convey the message that measures taken to achieve one purpose can have substantial, frequently undesirable, and unanticipated effects on attaining other objectives. Moreover, these unintended effects can sometimes swamp the intended in terms of their overall consequences. Garrett Hardin, the eloquent spokesman for many environmentalists aptly summed it up: "We can never do one thing." This is called the law of unintended effects (Chant, McFetridge & Smith, 1990: 82).

Systems thinking makes inherent sense in debates involving public policy, since economics considers the complex, interdependent social systems found in market systems and ecology considers the working of biological systems. Each trigger unintended effects that must be accounted for.

Unless they are accounted for, these unintended effects put us on the path to hitting the green wall. For example, few would suggest that the extinction of the dodo bird has ever had any demonstrable effect on the ecosystem. But, as Cairncross (1992: 131) writes, the fate of the dodo leads us to a better appreciation of systems.

> In fact, even the dodo had its value. Most of the Calvaria trees of Mauritius were at least 300 years old and seemed sure to die out. How to rescue the species? An ingenious botanist guessed that the trees' large, tough seeds had to pass through the gizzard of a big bird to germinate. Force-fed turkeys filled

> the dodo's ancient role and saved the trees. Thus does the fate of one species often determine the fate of many others, linked in barely perceptible ways and complex eco-systems.

Pal (1992: 272) articulates two related consequences of society's higher appreciation of "systems thinking." First, he acknowledges environmentalism's "introduction of a counterweight to the hubris of technological imagination." In contrast to the technological imperative—which would suggest that everything is possible—environmentalism reminds individuals that natural and man-made ecosystems embody an important array of variables. As Pal notes (1992: 272), the complexity of ecosystems means that the manipulation of even a single variable through public policy intervention can lead to "incalculable [ripple] effects...that...gather an accumulating force." Accompanying this is a heightened awareness of risk, with a commensurable decrease in the level of tolerance of risk and an intensified call for safety assurances.

The emerging environmental ethic challenges decision makers to develop a strategy for the management of our natural environment which addresses the responsibilities that current generations have to future ones, and which is safe and reliable in the long-run (WCED, 1987; Olivier, 1995). The NEA (1992) has articulated the issue of responsibility to future generations as follows:

> The principle that influences the attitudes of people in this matter include the general premise that it is wrong to knowingly commit preventable harm and that it is wrong to fail to take action which could prevent harm from occurring. And both of these apply even when it is impossible to identify in advance the people who may be affected.

The notion of responsibility to future generations has provided an impetus for the search for technical solutions to environmental challenges, a theme that was developed nicely in the report of the World Commission on Environment and Development's 1987, Our Common Future.[17] A key requirement, then, is a consideration of what degree of risk is acceptable. Since it is not possible to achieve zero risk, it is generally accepted that society ought to leave conditions and

[17] The commission, headed by Norway's Prime Minister Gro Harlem Brundtland, is also referred as the Brundtland commission. It defines sustainable development as "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs...[t]hus the goals of economic and social development must be defined in terms of sustainability in all countries - developed or developing, market-oriented or centrally planned" (p.43).

opportunities for future generations no worse than it would for itself. This, of course, supports the legal principles for environmental protection and sustainable development adopted by the WCED Experts Group on Environmental Law. A Summary of the principles which were proposed by the Commission is included as Appendix I.

The Political Reality of Environmentalism

Environmentalism has been referred to as a political reality of the twentieth century (Bates, 1957; McConnell, 1954; Hays, 1959; Rosenbaum, 1973; Macdonald, 1991). It was predated by "perceived policy problems, as well as public policy proposals and developments that failed immediately to crystallize into the unifying ideas and symbols of political movements" (Macdonald, 1989: 16). Today, environmentalism offers a guide to political action and a lens through which the political world can be interpreted. Macdonald (1991) suggests that support for environmental action, and hence the politicization of environmentalism, has been historically based upon three streams of thought: the principle of conservation and 'wise use' of natural resources; the appreciation of wilderness and the natural world for its own sake; and a concern for pollution effects on the public health of city-dwellers. He further suggests that the politicization of environmentalism has spawned a fourth stream of thought: the realization that environmental protection is inextricably linked to various other social issues. As Table 1 demonstrates, these streams of thought have evolved and expanded over time to include a myriad of issues and concerns. For the purposes of this research, we limit our discussion to pollution abatement and the broader issue of sustainable development. As Macdonald (1991: 30) posits, an understanding of these interconnected branches of the environmental movement is critical to comprehending the "objectives, values, and political strategies of the individuals and organizations working to influence government action."

Table 1: The Politicization of Environmental Support

Historical Concern	Contemporary Political Manifestations
Conservation and "Wise Use" of Natural Resources	Issues of fishery and forest depletion; the need for energy conservation to prevent global atmospheric change
Preservation	Concern for different species of plants and animals; animal rights; deep ecology; plus the more spiritualized and personalized aspects of bioregionalism and ecofeminism
Pollution Effects	Concern for pollution effects on the public health - focusing on both infectious diseases and carcinogenic chemicals

Writing about a new "radical critique" that underpins much of contemporary environmental politics, Robert Paehlke (1989: 36) suggests that environmentalism has evolved beyond the traditional questions of conservation and preservation. He describes that change as follows:

> At stake [is] not merely the 'wise use' of resources or the setting aside of ecological reserves. The new environmentalism claimed that problems lie at the very heart of the modern political economy, even in our basic philosophical and cultural outlook. Everything fits together - the physical, chemical, biological, social, political, economic and philosophical worlds - and must be understood as a whole. The symptoms of environmental problems may be measured biologically, but the disease itself lies in our socioeconomic organizations, and *the solutions are ultimately political* (emphasis added).

Responding to this politicization, Our Common Future (WCED, 1987) identifies sustainable development as a critical objective for all governments to pursue. Similarly, the 1988 World Conference on the Changing Atmosphere, the 1992 *World Development Report* published by the World Bank, and the United Nations Conference on Environment and Development, the 1992 Earth Summit, are representative of recent attempts to deal with both the political and economic issues related to global environmental action.

These efforts reflect the view that a paradigm shift in the values and beliefs that shape our politics and govern our contemporary western democratic societies is required. That shift,

it is suggested, has already begun (Inglehart, 1977). Evidence of a "value change" can be seen in the increasing emphasis on consensus and cooperation in continental and global environmental management over the past twenty years (Kanji and Nevitte, 1995). Inglehart (1990: 372-373) suggests that a "process of intergenerational value change is gradually transforming the politics and cultural norms of advanced industrial societies," suggesting that the emerging, postwar value system places less emphasis on accumulating wealth and, instead, assigns a higher priority to issues related to the quality of life.[18]

The belief in cooperation can thus be linked to the hope that a new set of environmental values, a new environmental consciousness, may come to better inform existing governments. If this happens, the existing system may suffice when infused with a new set of values and priorities. It is unlikely, however, that value change itself will be sufficient to address the full spectrum of collective action problems confronting the environment . That is, a more pragmatic approach to protecting the environment may be to focus on changing behaviours rather than the underlying values which support particular actions, with the hope that modified behaviours will spawn new values over time.

In the short run, for example, it may be more effective to impose fines on those who litter rather than attempting to inculcate a higher sense of appreciation for the land. It may be that, in the long-run, an entrenched behaviour modification may lead to the internalizing of greener values, but that the achievement of that behaviour modification will be contingent upon suitable economic incentives (or, in this case, disincentives). While ethically motivated environmentalists may cringe at such an assertion, a compelling case can be made for concentrating on the *end* as opposed to the *means*. Worded somewhat differently, it may be wise to avoid situations in which we cannot save the forest for the trees. An analysis of those policies which might encourage behaviour modification requires an understanding of economic

---

[18] A note of caution is in order here. Inglehart uses structural changes and a sustained postwar prosperity as a basis for suggesting that "the public has become more sensitive to the quality of the environment than it was a generation ago" (1990: 372-373). Given the lacklustre performance of the world economy since the early 1980s, it is not clear that this shift to postmaterialism is permanent. It does, however, suggest that achieving

continued on next page...

principles, the subject of the next chapter.

---

a strong economy can contribute to a higher sense of ecology within the pursuit of "the good life."

CHAPTER THREE

Environmental Economics

"The environment can no longer be used at zero cost and would not be if property rights were defined and enforced. The existing pollution problem thus is due not to the workings of a market economy, but to its very absence."
- Chant, McFetridge & Smith, 1990

"It's time to take the environment out of the warm, fuzzy area....You can't just say, 'I want to save all the dolphins in the world.' You've got to work out how to solve problems in the most cost-effective way."
- Richard Sandor, Former V.P., Chicago Board of Trade, 1996

Introduction

Like many other western democratic states, Canada relies largely on market forces to organize most of our economic affairs. In many aspects of the economy, competition between suppliers creates a downward pressure on prices and an upwards pressure on quality. Transactions related to goods with known characteristics—such as a particular grade of beef, a new automobile, or tickets to a theatre performance—allow both consumers and suppliers to make decisions based solely upon prices. They also allow us to "shop around" for deals that most suit our preferences. In this way, a decentralized market process will eventually lead producers and consumers to converge at an equilibrium price, at which production costs are minimized. It follows that "[t]otal output will be determined by the relative utility which consumers derive from one commodity compared to others" (Osberg, 1996: 1).

In a competitive market, individuals interact by trading with others, each executing those transactions that will increase his or her own utility or welfare. It is also true, however, that situations exist in which individuals affect each other in ways that are external to the market. The effects of such transactions upon others are referred to by economists as *externalities* or *spill-over effects*, which may be either positive or negative in their results. Community, provincial, or regional decision makers act rationally in attempting to provide the greatest benefit to their constituents at the least possible cost. Insofar as many activities in one location spill-over into other jurisdictions, other factors may assume a higher priority than

environmental quality if the polluting jurisdiction is unaffected by that pollution. That is, a jurisdiction which benefits from a particular activity may avoid bearing the full costs of that activity if the negative effects of that activity spill-over into other jurisdictions.

Consider the following example. Imagine that Eve incurs the expense and effort of growing an apple orchard in her part of the Garden. The benefit that Adam derives (from both the beauty of the orchard and the enhanced carbon dioxide absorbing capacity that it offers) are positive externalities—he benefits without having to incur costs. Now, consider another spin of this situation:

> Suppose that Eve sets up an apple press to manufacture cider, and the waste products associated with this process are dumped into a stream which flows into Adam's section of the Garden. As a consequence, Adam's drinking water is polluted and his utility declines (Rosen, 1988: 53).

Eve's cider production process is outside of the market in that she is not required to absorb the costs of the pollution that she creates and since Adam is unable to compete for property rights to water that is being used as a dumping ground. Eve's pollution negatively affects Adam's welfare and is therefore termed a negative externality.

In the absence of property rights, the presence of an externality (either positive or negative) will often persist because the market fails to allocate scarce resources efficiently.

> When costs are incurred or induced which are not reflected in the price to the consumer, or when the individual firm consciously or unconsciously externalizes costs (into the air, or water, or noise into the surroundings) then prices do not reflect all the costs and the possibility for misallocation of resources arises. To the extent that costs are externalized and become social rather than private, or are deferred into the future, prices are lower than they should be. With lower prices, we tend to produce and consume more than if prices reflected all costs (Science Council, 1977: 34).

In Rosen's version of the Adam and Eve case, the externality will continue because, even though water is scarce, nobody owns the stream and so nobody has to pay to use it. Typically, the result of not having to pay for the scarce water is that it will be overused at the expense of the environment and other individuals (in this case, Adam). Although Adam's water is polluted, Eve draws her drinking water from her unpolluted upstream location and so is unaffected by the pollution. In effect, she is able to avoid all costs associated with her polluting activity and will therefore be free to over-produce her cider. The result is a higher level of pollution than would otherwise result if Eve was required to internalize the full costs of

her activity.

Now shift the focus from Adam and Eve to two towns or provinces. Residents of one location may enjoy the full economic benefits of a mill which dumps effluent into the river, while foisting the environmental costs of that activity onto downstream locations. Given the economic incentive to continue polluting, and considering the perceived absence of costs of that pollution, little incentive exists for abatement on the part of the polluting location. In the absence of government intervention, then, there is little reason to expect that markets will automatically equilibrate at an efficient level of pollution abatement.

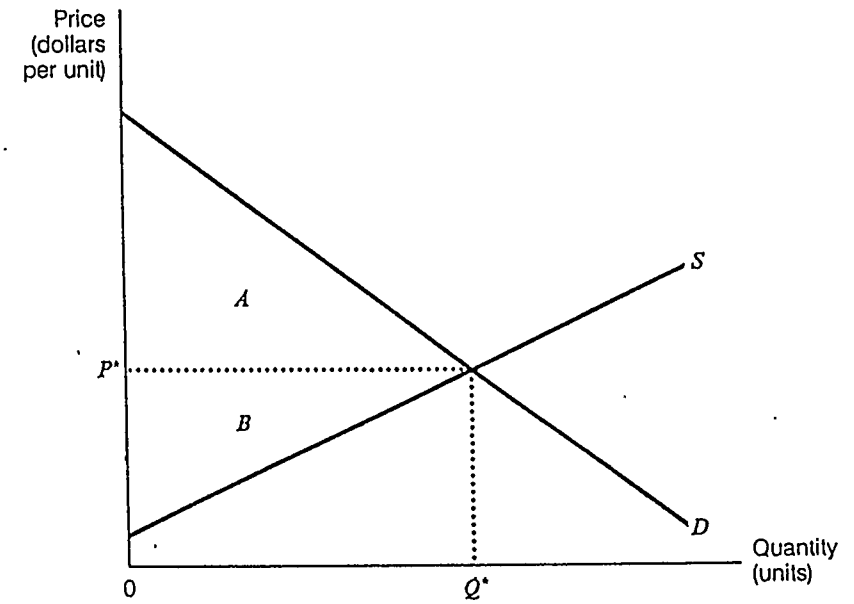
Unless a mechanism can be put into place that forces polluters to internalize the real costs of their activity, they will not be inclined to reduce pollution. At issue is the perverse reality that one can pollute the environment and reap the benefits of doing so while avoiding the associated costs. Even where competitive markets exist and operate freely, pollution effects are exacerbated by externalities and spill over effects. The challenge remains, then, to force polluters to internalize the *real* environmental costs of their activities. Economics presents a challenge to environmentalism insofar as there is an absence of a market for environmental protection.[19]

Economists describe individuals as utility maximizers who, in a market system, pursue those courses of action that will provide them with the greatest benefit at the lowest cost. In the case of private goods (groceries, furniture and clothing for example), the marginal price that utility maximizing individuals are willing to pay will be equal to the marginal benefit that a good represents to that individual. Indeed, the schedule of marginal prices that individuals are willing to pay is commonly referred to as a "demand" curve in economic discourse. As Figure 1 illustrates, an equilibrium quantity, Q^*, will be demanded at price p^*, the point at which the

[19] This, of course, is changing. Markets exist for recycling efforts, with some firms actually paying municipalities for refuse as feed stock in their production process. Where the majority of problems arise, however, is where markets do not exist because property rights have not been assigned (such as with air and water issues).

supply (marginal cost) and demand (marginal benefit) curves intersect.[20] Hence, individuals explicitly reveal their preference for a given quantity of a private good through the demonstrated price that they pay. It is this utility maximizing behaviour that allows us to understand the process through which notions of supply and demand lead the market to equilibrium. But how should we understand individual behaviour in the absence of a market?

Figure 1: Supply and Demand Curves



Collective Goods

Collective goods are those goods which exhibit "consumptive indivisibilities and, additionally, are fully accessible to all" (Tietenberg, 1994: 39). Consumption is indivisible when one person's use of that good does not reduce the amount of that good available for use by others. The air that we breathe, the water we drink, the mountains and parks in which we hike, and the Canada goose we value intrinsically, are all examples of collective goods. My ability to benefit from these goods does not reduce another individual's potential to do likewise, because I do not retain exclusive property rights over these resources.[21]

---

[20] Reproduced, without permission, from Tietenberg, 1994, p. 35.

[21] Of course, one's consumption of these goods could reduce another individual's potential to derive similar benefits if their actions result in negative externalities. For example, an individual who hunts Canada geese affects another's ability to enjoy the sight of the geese. We will return to this shortly.

Furthermore, one cannot effectively exclude others from consuming these goods. That is, they are accessible to all citizens.[22] As Rosenbaum (1977: 105) writes,

> environmental protection measures clearly fall into the category of policies whose benefits are presumed to flow to the public at large in the form of a safer, more enjoyable environment; these are collective benefits in the sense that "they must be available to everyone if they are available to anyone" (quoting from Crenson, 1971: 137).

Many policies advocated by environmentalists are examples of public goods policies.[23] For example, the benefits of clean air and water that derive from pollution abatement accrue to everyone.[24] But while the long term benefit seems largely intangible and are shared among society as a whole, the short term costs are substantial and are normally concentrated among a few individuals or firms. It is these characteristics that preclude the development of a market for the provision of such goods. Given the inability to exclude non-payers, what incentive exists for private provision? Hence, the provision of common goods normally falls to government.[25] But whereas public provision of common goods is necessitated by the absence of a market, efficient provision by government is hardly guaranteed.

Insofar as collective goods are, by definition, both indivisible and fully accessible, they present extremely complicated problems for the effective management of the environment in politics and government. Cynics would argue that the government lacks both the expertise and

---

[22]Admittedly, some public goods may be excludable (such as national parks that levy admission fees) but such complications offer little insight to the discussion at hand. For the sake of parsimony, then, excludable public goods will be omitted herein.

[23]Lighthouses, the maintenance of an Armed Forces, and the Canadian Broadcasting Corporation are other examples of public goods. They all qualify as public goods because: in each case, Canadians benefit equally (in a non-rival fashion) from their provision - even if they value the provision differentially; and because nobody is prevented from "using" them (non-excludability).

[24] In understanding the nature of public goods, it is useful to consider the classic example of a lighthouse. Once a lighthouse is built, the associated costs of operating it are unrelated to the number of boats making use of its beacon and use by one individual does not diminish the ability of others to use it (nonrival characteristic). Furthermore, it is impossible to prevent other potential users from likewise benefiting from the lighthouse (non-excludable characteristic).

[25]The preceding discussion should not be interpreted as suggesting that all public goods are provided publicly or that all private goods are provided privately. Indeed, some public goods (garbage collection and police protection are popular examples in the literature) can be effectively contracted out for provision by private firms. Similarly, some private goods (such as medical services and housing) can be provided publicly. Again, while these considerations are important, they are not central to the main arguments here. As such, considerations of public goods will be limited to the more problematic group of nonrival and nonexcludable goods as they relate to environmentalism.

the political will to coordinate sound environmental policy. We will return to this notion shortly. For now, let us consider whether or not it is reasonable to expect that private firms and individuals will be willing and able to resolve the issue and strike a balance between economy and environment. Past experience has yielded ambiguous results. Let us consider why this is so.

Recall that in the case of private goods, and assuming a perfectly competitive market, the price of a good is normally determined by the amount demanded and the amount of supply available. Whereas the slope of the supply curve is equal to the marginal cost of the good, individuals will be willing to pay a price along the supply curve that is coincident with a point on their demand curve. Depending upon their desire for that good, consumers will be willing to pay different prices for it. The demand curve for all consumers is derived simply by adding up the quantities of all goods demanded. When the demand curves for all consumers is aggregated, an equilibrium market price is determined and an efficient quantity of the good is provided in society. The same principles cannot, however, be applied to collective goods.

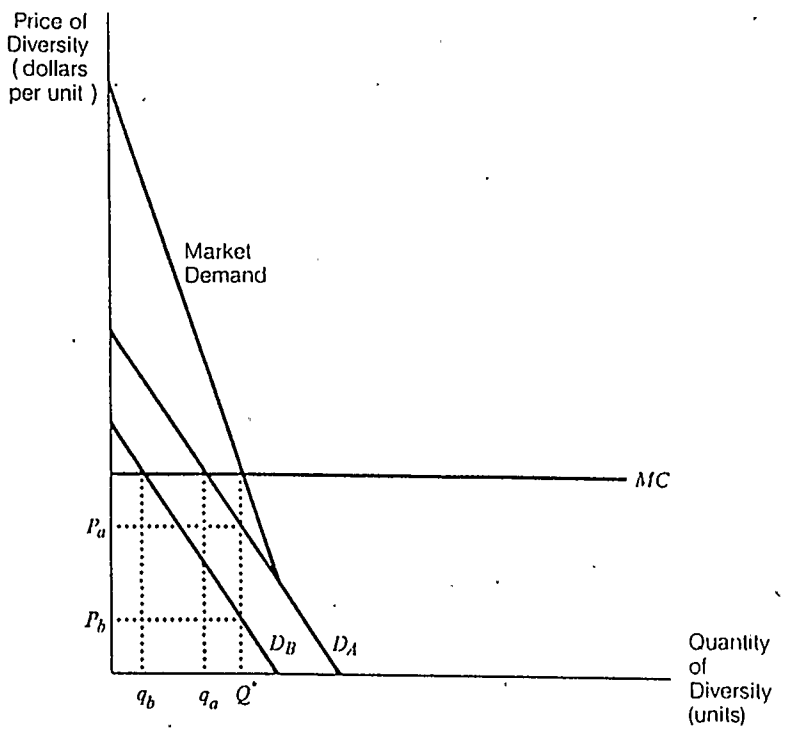
Deriving the aggregate demand for a private good was achieved by simply adding up the total quantities demanded, based upon individual preferences (this process is called *horizontal summation*).[26] Recall that collective goods, however, are both indivisible and fully accessible. This means that all individuals necessarily consume a collective good in *equal amounts*, regardless of preferences. For example, national defense benefits all Canadians to an equal degree regardless of the amount of protection that each citizen would be willing to demand over a given price range. Furthermore, the provider of the collective good (normally government, but not necessarily) must pay a constant price for the provision of that good. Recall also that in the discussion of private goods, the upwards sloping supply curve was derived by the marginal cost of providing that good. Whereas the provider of a collective good faces a constant marginal cost of providing the collective good to consumers, however, the

[26] For an instructive illustration of both horizontal and vertical summation, see Rosen, 1993.

producer faces a flat supply curve.

To find the aggregate demand curve for a collective good, we use a technique called *vertical summation* in which we add up the prices that each would be willing to pay for a given quantity. In Figure 2,[27] we can represent the demand curves for ecological diversity according to the preferences of two individuals, persons A and B. A values diversity more than does B, as seen by her higher demand curve, D_A. The market demand curve is represented by the vertical summation of all individual demand curves. A vertical summation is required because all individuals can 'consume' the same amount of diversity, so we can add the numbers of dollars that they would be willing to pay for that fixed level of diversity given by the flat supply (or marginal cost) curve.

Figure 2: Public Goods and Inefficiency



[27] Reprinted, without permission, from Tietenberg, 1994, p. 40.

The efficient level of diversity, then, is achieved where net benefits are maximized (given by the area represented geometrically by the portion under the demand curve that lies above the marginal cost curve). In this example, the efficient level of diversity will be provided at quantity Q^*, the point at which the market demand curve intersects with the marginal cost curve. Further technical details regarding the actual derivation of aggregate demand curves are not required for this discussion. What is important to realize is that "normal" supply and demand pricing conventions do not work in the case of collective (public) goods. Typically, this economic explanation embodies several limiting assumptions. The most difficult assumption to reconcile is the notion that we can accurately determine "the price that each would be willing to pay for a given quantity" of a collective good.

Free Riders

In reality, it is extremely difficult to ascertain the real price that individuals would be willing to pay for a given level of collective good provision. Introductory economics teaches us that individuals are utility maximizers and that we maximize our own utility based upon our own set of preferences. Given that environmental protection is nonrival and nonexcludable, we should not be surprised to learn that incentives exist for individuals to misrepresent their preferences for protection. As Samuelson notes (1954: 389), "any one person can hope to snatch some selfish benefit in a way not possible under the self-policing competitive pricing of private goods" because it is possible to enjoy the benefits while letting others pay. The phenomenon to which Samuelson refers is termed the *free rider* effect. Since an incentive exists for individuals to free ride on the efforts and contributions of others, and since free riders have an incentive to understate their true preferences, levels of reported demand often fall short of real demand and inefficient levels of provision result (Rosen, 1988: 71).

Note that it need not be the case that individuals simply do not value the environment for inefficient levels of provision to result. On the contrary, they may value it greatly: the problem is that they seek environmental protection at the expense of others. For example, at least some people would agree that the reduction of automobile emissions in urban areas is a

desirable end. What is unclear, however, is the extent to which those *same* individuals would be willing to sacrifice the convenience of their own vehicle (by means of car pooling, making use of public transit, or walking) in order to achieve that end. Given the magnitude of environmental problems, it is understandable that individuals might think it easier and less costly just to continue one's own practices and let others worry about "fixing the world"—particularly if one's efforts are likely to have little material effect (Olson, 1965). Even if all individuals value the environment, then, it is by no means certain that each will be willing to bear the costs of protection unless the marginal benefits of doing so are sufficiently high to offset the associated marginal costs. This is the essence of the free-rider problem, and this notion is consistent with the collective action literature which suggests that rational individuals will seek to enjoy the benefits of protection while escaping associated cost payments wherever possible (Olson, 1965).[28] When this occurs with respect to pollution prevention, environmental protection and sustainable development, it is likely that environmental objectives will be under represented in public policy since government is hard pressed to garner support for expensive environmental initiatives.

It is the inefficiency caused by the free rider effect that leads to the assertion that government provision of a collective good (clean air in this case) is necessary. Insofar as governments cannot necessarily determine true preferences any easier than the reader might, the probability of inefficient outcomes remains high when free rider attitudes intersect with environmental externalities and spill-over effects. What role exists, then, for governments with respect to the provision of collective environmental goods? Can the inefficiencies of the free rider problem be overcome through normal command and control mechanisms? What other tools can the government turn to in encouraging firms to control pollution? More to the point, is it possible to create economic incentives that make potential free riders *want* to modify their

[28]This is not to suggest that altruism does not exist or that all citizens will free ride. Rather, it is argued that free rider effects pose a significant challenge to environmentalism in that they typically lead to a less than efficient level (MB=MC) of environmental protection. For evidence of altruism at work in Canada, see Appendix 2.

behaviour?

A Green Critique of Neoclassical Economics

Many of the preceding arguments have reflected a more general critique of neoclassical economics. Neoclassical economists suggest that a free market will lead to an increase in output (supply) in response to the increased demands that result from a growing population—this is commonly referred to as economic growth. Environmentalists criticize neoclassical economics for this characterization of growth and reject the underlying values that support it. In addition to being shaped by considerations of technology and economic growth, public policy is shaped by societal beliefs and values. When policies and systems of behaviour flow "logically" from those beliefs, we say that a dominant social paradigm exists. During the years of rapid growth throughout the twentieth century, the social paradigm that dominated the formation and implementation of environmental policies was one which largely reflected neoclassical beliefs about economics.

This paradigm has traditionally reflected the belief that continued economic growth, measured by Gross National Product (GNP), is always desirable (the "more is better" issue discussed earlier). Environmentalists criticize this paradigm for two main reasons. First, it propagates a sense of unlimited resources. Faced with the possibility that resources may indeed be scarce (finite), neoclassical economists counter with the assertion that so long as technology remains unconstrained and prices are allowed to adjust to stimulate the search for substitutes, issues of resource scarcity can be postponed indefinitely (Porter and Brown, 1991: 27). Environmentalists question this faith in technology and argue that it offers a weak and uncompelling defense of capitalism.

Second, the economic paradigm assumes that a free, unregulated market will always lead to maximum social utility, but this result is not at all self evident. Environmental challenges reflect the "tragedy of the commons," a phrase introduced to the literature by Garrett Hardin (1968: 1243-1248). Hardin postulated that in the absence of effective pricing mechanisms, individuals maximize their use of the "commons," deriving short term individual

benefits while deferring long term social costs of over-use. Environmentalists assert that this destructive phenomenon persists even today, more than a quarter of a century later after Hardin penned his analysis:

> [T]he earth's major natural systems—the oceans, atmosphere, lands, and climate—are being degraded and destroyed by a parallel set of circumstances. Economic actors have maximized their own interests by disposing of their toxic wastes in the oceans and other dangerous chemicals in the atmosphere because it was the cheapest way to do it. They have logged tropical forests and taken as many fish from the oceans as they could because it was profitable. The environmental cost of a polluted atmosphere or depleted fish stocks have been passed on to human society as a whole, whereas benefits of cheap waste disposal and exploitation of natural resources accrue to specific groups (Porter and Brown, 1991: 29-30).

Examples of these concerns are prevalent today. Consider the federally legislated fishing moratorium in Atlantic Canada. The entire northern cod fishing industry has been literally shut down in response to an alarming absence of northern cod, a result believed to have resulted from past over-fishing practices. The result of the moratorium was to plunge a large portion of the Atlantic workforce into unemployment and to create a hostile public policy environment which has plagued successive provincial and federal governments alike. In addition, it is common knowledge among Atlantic Canadians that there is not one species of fishery stock in the east coast fishery—including crab, lobster, turbot, mackerel and flounder, just to name a few—that have not had their quotas drastically reduced in this decade.[29]

Contemporary economists counter these critiques, noting that "It is not scandalous to decide that everything has its price; the real scandal lies in setting that price at zero or at some token level that invites us all to destroy these resources" (Baumol & Oates, 1974: 245). Additionally, Ronald Coase (1960) demonstrated more than thirty years ago that if property rights are well defined and legally protected, and if transaction costs are minimal, then economic agents will enter into trade agreements through which their interdependencies will be acknowledged and mutual gains will be achieved. Key to the Coase Theorem[30] is that the

---

[29] In the United States, the volatile debate surrounding the endangered northern spotted owl has been essentially a struggle between short-run logging benefits to the local community and long-run extinction "costs" to the national community. The circumstances surrounding the plight of this owl contribute to our understanding of environmental economics and are summarized in Appendix 3.

[30] For a more in-depth explanation, see Ronald Coase, 1960.

assignment of property rights creates a market for a particular good or service for which no market previously existed.

> Whether these rights are held by an individual, corporations, non-profit environmental groups, or communal groups, a discipline is imposed on resource users because the wealth of the owner of the property right is at stake if bad decisions are made. Of course, the further a decision maker is removed from this discipline—as he is when there is political control—the less likely it is that good resource stewardship will result (Anderson & Leal, 1991: 3).

How do the concerns of environmentalists serve to inform decision makers with respect to public policy? Effective public policy seeks ways in which to encourage those who "make their living from extracting, shaping, and distributing the materials of commerce...[to] assume responsibility for the ultimate fate of the materials" (Sarokin, 1992: 328). It is the pursuit of this challenge that will lead us to a discussion of environmental and non-environmental policy options in Chapters 4 and 5, respectively.

While economic principles do not themselves guarantee environmental protection vis-à-vis pollution abatement, the assignment of property rights and the establishment of market system have much to offer environmental ends. By utilizing economic building blocks which creating markets for environmental protection, then, public policy may be able to achieve both short-run pollution abatement goals and long-run sustainable development goals. By providing appropriate incentives for responsible behaviour and by de-emphasizing restrictive regulations, by using more carrots and fewer big sticks, it may be possible to facilitate a meaningful convergence of the principles of both economics and environmentalism.

CHAPTER FOUR

Environmental Policy Options (More Carrots, Fewer Big Sticks)

"In trying to clean up the environment without crippling the economy, the challenge is to design interventions that permit flexible response and long-term adjustment."
- Leslie A. Pal, 1992

"A Liberal government will use economic instruments for environmental protection, as a complement to the traditional regulatory method, where these can offer the lowest-cost and most flexible methods of achieving environmental goals."
- Liberal Red Book, 1993

Introduction

Canada does not have one general piece of national legislation which covers all aspects of the environment. Rather, a broad spectrum of provisions are embodied in a number of provincial and federal statutes. Federally, environmental legislation is typically concerned with criminal law; seacoast and inland fisheries; migratory birds; navigation and shipping; taxation; regulation of trade and commerce; spending power; federal public lands, and lands reserved for Indians. Provincially, most environmental law problems are dealt with under three areas of jurisdiction within the province—property and civil rights, matters of a local or private nature, and local works and undertakings. In some cases, then, the federal parliament has the sole authority to legislate over environmental matters. In other cases, authority remains with the province. And to further complicate the issue, cases exist wherein Parliament and the provincial legislatures share concurrent jurisdiction.[31]

Given the increasing demands for action from environmental groups, governments, international protocols and Canadians in general, domestic policy-makers face intense pressures to find cooperative solutions to a broad array of environmental concerns. But

[31]Consider the following example. Natural resources such as rivers are within the jurisdictional domain of the provinces. Authority over navigable waters and fisheries, however, is vested in the federal government. And where federal and provincial statutes overlap, the provincial statute is only applicable to the extent that it does not directly conflict with the federal legislation. This was the essence of the debate over the building of the Old man River dam in southern Alberta. The province authorized the dam, but opponents sought and received the support of the federal government in forcing further environmental assessments.

finding the right solutions to specific environmental challenges is not a simple task and there are no easy answers. Each of the various policy options which the government has at its disposal brings with it associated costs and benefits. The challenge that faces policy-makers is to identify the most appropriate mix of policy tools which can achieve desired environmental objectives at a reasonable cost. The issue of balancing environmental and economic considerations when framing policy takes on added importance given Canada's sluggish economic performance and the need to foster international competitiveness.

Key to Canada's largely resource-based economy and the environment is the efficient use of energy. Policies which permit cost-efficiency gains and a shift towards renewable energy sources, such as wind and solar, offer a potential means of reducing the intensity of our reliance on dirtier, non-renewable fossil fuels. Historically, governments in Canada have chosen to use a relatively inflexible "command and control" (C&C) regulatory approach to limit pollution emissions.[32] This has normally taken the form of placing a ceiling on pollutants and assigning a mandated role for industry to play in achieving the stated objective. But more flexible legislation, based on establishing performance standards and the use of market instruments, may provide better economic incentives and technological advantages for firms which are willing to clean up their act.

At this point, it is useful to review the major pieces of legislation which serve as a backdrop for environmental dialogue in Canada. Here, we briefly consider the nature of environmental legislation through the lenses of the *Canadian Environmental Protection Act*, the *Canadian Environmental Assessment Act*, and selected provincial Acts. Later in the chapter, we will review several policy options available to the government and compare the relative benefits of market-based approaches compared to the traditional emphasis on more inflexible,

[32] It should be noted that even as we shift away from strict controls, economic instruments have not yet really caught on in Canada. Rather, there has been a shift to voluntary arrangements with industry and regulatory agencies in recent years. It may be that voluntary measures will continue to grow in prominence in the future, but it will still fall to governments to deal with those firms who do not meet established targets (see OECD, 1995: Chapter 6). For the purposes of this research, the potential of economic instruments to encourage pollution abatement and the broader principles of sustainable development remain impressive.

regulatory measures.

Canadian Environmental Protection Act

The *Canadian Environmental Protection Act* (CEPA) was Tabled in the House of Commons as Bill C-74 on June 27, 1987 and passed into law on June 30th, 1988.[33] It deals with the regulation of toxic material, nutrients, ocean disposal, trans-jurisdictional air pollution and managing federal government activities with a view to environmental responsibility. The purpose of the Act is to secure the full protection of the environment in Canadian federal legislation, a sentiment neatly captured in its initial declaration that "the protection of the environment is essential to the well being of Canada."

The Act recognizes three primary concerns: protecting the environment for its own sake, safeguarding it because of its direct link to human health and, finally, avoiding the potentially harmful effects on human health of changes in the environment.

> The core of the Act is concerned with control and regulation of toxic substances during their full life cycle, namely, from research and development through production, transportation, use and storage, to ultimate disposal. The bill consolidates the environmental protection powers of the Clean Air Act, the Environmental Contaminants Act, the Canada Water Act, Part III, the Ocean Dumping Control Act, and the Department of the Environment Act, section 6(2). Serious violations of the Act's provisions may result in criminal prosecution with a maximum penalty of life imprisonment.[34]

CEPA also represents an acknowledgment on the part of the federal government of a need for national environmental objectives and codes of conduct as well as an obligation to fulfill international environmental obligations (Benidickson, Doern and Olewiler, 1994: 17).

CEPA has been credited for the elimination of both PCB use and leaded gasoline and is believed to have been effective in dealing with ocean dumping and pulp and paper effluents. It has controlled ozone depleting substances so well that Canada is exceeding its commitments under the Montréal Protocol and Canadian businesses find themselves on the leading edge of CFC-free products and services. And while the Act has contributed to the achievement of environmental goals, it has also enhanced economic performance.

---

[33]The Bill first appeared in the House in draft form on December 18, 1986. In response to the recommendations and suggestions for clarification that arose from public consultations, the bill was substantially re-drafted before being reintroduced. For a more detailed account of the process, see Environment Canada, Spring 1987.

> In Canada, there are some recent and powerful examples of environmental goals improving economic performance. The pulp and paper industry and its efforts to meet CEPA obligations and eliminate dioxins and furans is one such example. Today, cleaner plants, better resource productivity and an improved environmental image have helped the pulp and paper sector maintain markets, and capture important new ones....Under commitments made in the Canada-US Air Quality Agreement, reducing sulphur dioxide emissions to save lakes and streams also helped economic performance in Canada. By investing in sulphur dioxide abatement programs and modernizing their facilities, base metal producers and other heavy industries are more cost efficient and more energy efficient, and acidified lakes are returning to normal.[35]

The Act is far from perfect, however. Even the government concedes this. On December 15, 1995, The Minister of the Environment tabled her department's response to the House of Commons Standing Committee on Environment and Sustainable Development's mandated five-year review of CEPA.[36]

Essentially, the Committee acknowledged that CEPA is too limited in scope, that it is reactive rather than proactive with respect to environmental problems. The Minister's response underlined the need for a process of renewal which included an emphasis on sustainable development, pollution prevention, the ecosystem approach and biodiversity — concepts which had not fully emerged when CEPA was originally being crafted. In particular, the proposed changes demonstrated a will to shift from the principle of pollution control to that of pollution prevention.

The Government's response proposes to ensure that toxic substances are virtually eliminated in Canada, or that they are managed from "cradle to grave."[37] It suggests that companies using or producing substances determined by CEPA to be toxic will be required to implement pollution prevention plans and there is evidence that business supports this principle.[38] Government inspectors will be given greater authority to enforce compliance

---

[34]For additional details, see Library of Parliament, September 1987, p. 11.

[35]A complete outline is provided in Government of Canada, 1995a.

[36]The Committee conducted 55 public hearings, heard testimony from more than three hundred witnesses and reviewed seventy-one written submissions. It Tabled its report, *It's About Our Health! Towards Pollution Prevention, CEPA Revisited* on June 20, 1995.

[37] This is a common phrase in the business community and refers to the full life-cycle of a product.

[38]NOVACOR Chemicals Ltd. provides a good example of corporate responsibility in this regard. For a discussion of NOVACOR's Safety, Health, and Environmental Risk (SHER) management system and its "Responsible Care" program, see Tek Chin, Ross Burns and Sam Fenimore, 1995.

measures and to reduce court backlogging. The public will be granted the right to file civil suits against any future federal government which fails to enforce the amended Act. The renewal proposals also call for voluntary abatement and prevention strategies[39] and for the use of economic instruments, each supported by clear policies and effective regulations.

Canadian Environmental Assessment Act

The *Canadian Environmental Assessment Act* (CEAA), which received Royal Assent on June 23, 1992, legislates the requirement for environmental assessments at the federal level. It is intended "to ensure that the environmental effects of projects receive careful consideration before responsible authorities take actions in connection with them" and "to encourage responsible authorities to take actions that promote sustainable development and thereby achieve or maintain a healthy economy." CEAA also seeks to ensure that "projects that are to be carried out in Canada or on federal lands do not cause significant adverse environmental effects outside the jurisdiction in which the projects are carried out."

Bill C-13, as it was known, was controversial because some witnesses, representing both industry and business, objected to the requirement that "cumulative effects" of a project be considered in the assessment process. Representations from environmentalists and native groups, however, suggested that the Bill did not go far enough. Environmental groups criticized C-13 because it did not mandate assessments of government policies and programs and native groups worried that it did not adequately protect their treaty and aboriginal rights. The Act was later amended to respond to these and other criticisms.[40]

---

[39] In November of 1995, more than 200 industrial companies and 14 associations agreed to accept a climate change challenge led by the federal Minister of Natural Resources. In addition, industry supports the Climate Change Voluntary Challenge and Registry program through the 14 industry associations representing the approximately 3000 companies which participate in the Canadian Industry Program for Energy Conservation.

[40] On December 15, 1994, Bill C-56, *An Act to Amend the Canadian Environmental Assessment Act*, was proclaimed into law. The Act amended its 1992 predecessor in three respects: it required a participant funding program to be established by the Minister; it stipulated that, where possible, only one federal environmental assessment need be carried out for a given project; and it required that Cabinet approve any response required from a federal authority in those cases involving a report and recommendations of a mediator or review panel.

Provincial Environmental Acts

Provincially, Ontario's *Environmental Assessment Act* (OEAA) of 1975, *Alberta's Environmental Protection and Enhancement Act* of 1992, the Yukon's *Environment Act* of 1991 and Manitoba's *Environment Act* of 1987 express goals that emphasize environmental protection while acknowledging that such protection is "subject to internal constraints associated with economic development" (Benidickson, Doern and Olewiler, 1994: 17). In the Yukon, reference is made to the principle that "economic development and the health of the natural environment are inter-dependent." In the case of Manitoba, the Act goes so far as to explicitly acknowledge the duality of the issue. The Manitoba Act seeks to

> develop and maintain an environmental management system...which will ensure that the environment is maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for this and future generations.

Alberta's EPEA is particularly noteworthy in that it strives to "support and promote the protection, enhancement and wise use of the environment" through the pursuit of the following principles (Benidickson, Doern and Olewiler, 1994: 18):

- maintaining the integrity of ecosystems and human health and the well-being of society;
- promoting economic growth and prosperity in an environmentally responsible manner, and integrating environmental protection with economic decisions in the earliest stages of planning;
- achieving sustainable development;
- preventing or mitigating the environmental impact of development and of government policies, programs, and decisions;
- ensuring opportunities for citizens to provide advice on decisions affecting the environment; and
- encouraging polluters to pay for the costs of their actions.

While environmentally responsible measures are encouraged by existing legislation, then, it is also true that economic efficiency and voluntary compliance mechanisms are important factors in Canada's current environmental policy regime. Although Chapter 5 will develop the broader theme of encouraging environmental protection through non-environmental policy methods, the remainder of this chapter outlines several regulatory and market-based strategies for the first prong of our sustainability agenda, that of encouraging pollution abatement.

Pollution Abatement Policy Options

Chapters 1 through 4 have provided a brief literature review of the main economic and political challenges to environmental protection. In the remainder of this chapter, we consider the real work of environmental policy makers, that of incorporating all of the competing economic and political challenges in a workable strategy. In particular, we consider several available options for pollution abatement and apply a "Triple-E" approach to analyzing each. A Triple-E policy is one that is at once effective, efficient, and equitable. Moreover, each of these characteristics has value in such a policy. But as Table 2[41] suggests, several challenges face proponents of a Triple-E abatement policy.

Table 2: A Typology of Challenges Presented by Pollution Abatement Issues

Abatement Issue	Free Riders	Externalities	Bias of Rules
Ambient Air Quality	yes	yes	yes
Ozone Depletion	yes	yes	yes
Global Warming	yes	yes	yes
Ground Water	yes	yes (locally)	yes
River Quality	yes	yes	yes
Oceans and Lakes	yes	yes	yes

First, there are many abatement issues that must be considered (column one). These are not mere conceptualizations that have been conceived in the minds of theorists to facilitate scholarly debate. They are complex and concrete issues that demand unique strategies since one over-arching policy cannot hope to speak to the myriad of complications presented by the entire range of existing issues. Second, free rider effects and externalities (columns two and three) lead to extremely daunting efficiency and equity challenges. Similarly, many biases of

[41]Adapted from concepts in Peat, Marwick and Partners, 1983, pp. III-8 through III-11.

the governmental process,[42] or "rules of the game" (column four), require opposing groups to compete for access to both elites and the resources that they control. Not infrequently, this leads to battles of redistributive politics that make issues of equity largely intractable. Finally, the bias of rules also permits organized interest groups to delay or avoid actions prescribed by legislation, effectively rendering environmental policy impotent and ineffective. Table 2 considers only a very tentative list of abatement issues. If one considers the broader array of conservation, preservation, and pollution issues that exist, the challenges identified above become even more unwieldy.

Environmentalists would argue that if pollution abatement rhetoric and environmental potential are to rise above the status of symbols in environmental protection, it will be necessary for competing economic and political forces to be acknowledged and addressed in related policies. A report of the Organization for Economic Co-operation and Development (OECD, 1980) states that strategies must be: based on pollution parameters that truly represent the pollutant in question; easy and inexpensive to measure; easy to understand; and acceptable and pertinent to all interested parties. Perhaps the most prevalent alternative means of achieving this end are *non-compliance delay penalties, emission (or effluent) charge systems* and *transferable emission rights* systems. We can compare all of these strategies to the traditional command and control system and offer a Triple-E evaluation of each.

Command and Control

Traditionally, attempts at pollution abatement in Canada have been represented in what is largely described as a command and control (C&C) regulatory system. This system is firmly grounded in environmental objectives that seek:

> to protect human health and the natural environment from deterioration and damage. Clear and explicit objectives also provide a basis on which to evaluate progress and to set priorities (Peat Marwick and Partners, 1983: II-3).

[42] This refers to incrementalism, the influence of interest groups, the diffusion of power in a federal state, the influence of bureaucracies, and the emhoasis on economic interests in cost-benefit analyses.

Additionally, a clear understanding of those objectives affords decision makers the opportunity to readjust strategies and priorities, an ability that is critical in an ever-changing environment.

C&C systems prohibit pollution through laws, standards, guiding principles, limits, and technology requirements.[43] For example, Section 5(1) of Ontario's *Environmental Protection Act, 1981*, states that:

> No person shall deposit in, add to, emit or discharge into the natural environment any contaminant, and no person responsible for a source of contaminant shall permit the addition to, emission or discharge into the natural environment of any contaminant from the source of contaminant, in an amount, concentration or level in excess of that prescribed by the regulations.

Such regulations are usually quite specific and are normally targeted at the most sensitive agent in the environment.[44] It has been well documented that traditional command and control systems of environmental protection lack the requisite monitoring and enforcement capability of effective control. One explanation for this is that much of the information that is required in the development of sound policy and in the monitoring of compliance is vested firmly in the hands of business (Schrecker, 1991: 335). Insofar as business controls the flow of technical information, government often finds it difficult to formulate, let alone enforce, realistic standards.

In the absence of effective enforcement, the likelihood of real gains in environmental protection is minimal at best. It is for this reason that governments must seek the support and cooperation, rather than mere compliance, of business. A practical alternative to outdated command and control techniques is found in the pursuit of market based incentives for pollution control. Market based strategies may include pollution charges, tradable permit systems, and deposit-refund systems.[45] Additionally, a compelling defense has been

---

[43]For a more comprehensive discussion of standard setting, see D. Macdonald, 1991.

[44] For example, the upper limit concentration of mercury in Great Lakes fish, 0.5 micrograms, is intended to protect those birds who feed on Great Lakes fish (Agreement Between Canada and the United States of America on Great Lakes Water Quality, 1978).

[45] A less interventionist strategy may be to simply remove *existing* "government-mandated barriers to market activity" (Stavins, 1992: 24). Consider the initiative that was pursued in Southern California in 1988. The Metropolitan Water District of Southern California negotiated an agreement on a $233 million water conservation and water rights transfer deal with the Imperial Irrigation District. This agreement was facilitated by measures that made the voluntary exchange of water rights possible.

developed for the assertion that governments must cease the subsidization of inefficient or environmentally unfriendly industries. Rather, they ought to encourage the development of future oriented technologies, as Japan did in the 1970s.[46] It is interesting to note that the 1996 Budget reflects Canada's readiness to support knowledge-based, environmentally friendly industries and research. Insofar as government is able to manipulate circumstances in order to facilitate environmental reform, then, real change may be possible. Japan is an excellent example of this fact given that it has been a world leader in pollution control since 1975, yet it has maintained one of the highest growth rates in the industrialized world.

Enforcement of regulations often begins with the negotiation of abatement strategies between polluters and the agencies charged with environmental protection (Dewees, 1980: 27-31). As Dewees suggests, the goals explicated in the legislation are not normally fully satisfied. Insofar as the negotiated programs are mutually acceptable to all parties, however, they do effect some degree of environmental progress. Other mechanisms, such as the Control Order and the "power to restrain by action" (an injunction) identify pollution problems and require polluters to provide an appropriate response or become liable to prosecution and subject to fines. In the latter case, failure to comply constitutes contempt of court — a criminal offense which can lead to a jail sentence.

While the C&C system does enjoy some measure of compliance with its regulations, characteristics of the system limit the potential for maximizing environmental protection. In particular, the criticisms (Peat Marwick and Partners, 1983) that follow are reminiscent of the issues of free riders, externalities, and governmental biases that were presented in Table 2, above. Critics of C&C argue the following:

- The cost of compliance often exceeds the cost of non-compliance, since court imposed fines are often unsubstantial. As a result, polluters face powerful incentives to continue polluting rather than abating (ineffective);

[46] In a dramatic shift from subsidizing inefficient and environmentally unsound "loser" industries, Japanese leaders took the bold step of encouraging the development of "knowledge-intensive, non-polluting industries that had a high value-added, high technology component: advanced computers, semiconductors, information processing, and software" (Kraus and Pierre, 1993:166).

- Once full compliance has been achieved, there is no incentive for further abatement (ineffective);
- Incentives for effective and efficient operation of facilities are lacking (ineffective and inefficient);
- The appeal process allows polluters to delay compliance (ineffective);
- Uniform standards disregard variances in abatement costs (inequitable);
- Targets do not account for establishment of new polluting sources (ineffective); and
- The litigation process often focuses on procedural issues rather than on the actual pollution problem (ineffective).

These criticisms suggest, then, that the C&C system suffers from problems of ineffectiveness, inefficiency, and inequity.

Non-Compliance Delay Penalties

This system is very similar to the command and control (C&C) systems discussed above. In C&C cases, penalties are imposed by the courts, a process which is frequently lengthy and expensive. Perhaps most damaging to environmental interests is that court-imposed financial penalties are rarely so substantial as to deter future transgressions.[47] Another challenge to environmental interests, however, is that penalties are not imposed until after a firm is convicted of an environmental offense. So while the court battle is being waged, an incentive exists for the firm to continue polluting in order to continue the generation of profits. By the time the case is decided, and even if the court rules against the firm, the firm has benefited greatly from the delay tactics.

In non-compliance delay systems, however, penalties are imposed by the environmental agency from the moment non-compliance has been identified. Because these penalties are automatically awarded by environmental agencies and remain external to the judiciary, they also tend to be large and are normally based on abatement costs or the cost savings that have accrued as a result of non-compliance. Hence, rational firms will have an incentive to implement abatement programs since the private benefits (social costs) of non-compliance are no longer avoidable. The assessment of delay penalties allows us to eliminate

[47]A recent U.S. case involving Calgary-based TransCanada Pipelines Ltd. provides an example of American
continued on next page...

the economic incentives of non-compliance associated with traditional C&C systems. It fits well with the current system and since it will not raise revenue (aside from fines for non-compliance), polluters incur only agreed upon abatement costs.

One criticism of a delay penalty system is that it does not necessarily provide an incentive to abate further, or to develop better abatement technology. Another criticism is that abatement cost data and estimates of cost savings accruing from non-compliance (necessary for setting penalties) may be difficult to ascertain. In general, then, this system does not embody a sufficient range of economic incentives to qualify as a Triple-E (effective, efficient and equitable) policy alternative.

Emissions Charge Systems

Emission charges can often be used to force firms to internalize the negative externalities created by their polluting activity. In economic terms, these taxes provide an incentive for polluters to consider the social costs that their actions impose upon others. Such taxes are normally termed Pigouvian taxes, named for the economist A.C. Pigou. Pigou suggested levying a tax on a polluter that makes up for the fact that some of his inputs are priced too low. A Pigouvian tax is a tax levied upon each unit of a polluter's output in an amount just equal to the marginal damage it inflicts at the efficient level of output. Since taxes raise a polluter's marginal costs (i.e. shifts the firm's marginal cost curve up) and given that the marginal benefits of polluting remain unchanged, a new, lower level of pollution will result where marginal benefit equals marginal cost. Efficiency, by definition, will be achieved at this new equilibrium.

Note too that the emissions reductions occur precisely *because* the firm seeks to avoid paying emissions taxes. But even at the equilibrium level, where MB=MC, an equilibrium level of pollution will persist. Hence, revenue is generated no matter what level of pollutants firms elect to emit (assuming emissions exceed zero). Given this, it should be clear that emissions charges may serve two functions: (i) to provide an economic abatement incentive and

---

intolerance of environmental interferences. See Appendix 4.

(ii) "to generate revenue for redistribution to victims of pollution or to subsidize abatement programs" (Peat, Marwick and Partners, 1983: III-6). Canadian examples of this abatement strategy include the sewer surcharges that cities such as Toronto, Hamilton, London, and Waterloo have instituted in Ontario. Like any policy alternative, several pros and cons can be identified with respect to emissions charges. These are captured in Table 3[48], below.

Table 3: Pros and Cons of Emissions Charge Systems

Advantages	Disadvantages
Reduced incentive to delay abatement since costs accrue during delay process (effective)	Seen by public as a "license to pollute"; creates less certainty than Command and Control emission standards
Ongoing financial incentive to keep reducing emissions (effective)	Creates uncertainty for polluters who desire technical guidelines to build abatement systems
Offset growth in capacity and emissions since increased discharges yield increased payments (effective and efficient)	Locational and process differences may necessitate different charge rates; good for capturing efficiencies but may be unpopular
Considers variances in abatement costs across firms; instead of targeting a standard level of pollution, each firm approaches own efficient level; may result in lower over-all pollution (efficient and equitable)	Creates "double burden" in that firms pay both abatement costs AND residual emission charges; economists would argue that polluters are merely paying costs (i.e. for use of air or water as a dumping site) that they previously avoided
Source specific emission objections not required in absence of technical data; levying a minimum charge rate still induces abatement (effective)	Increases information requirements beyond that needed in current C and C system
Incentive to conduct research and development (effective)	Charges based on concentration thresholds encourage increased pollution if polluter can dilute waste first
Revenue generated could be used to reduce other taxes, pay compensation for damages to "victim," financial communal treatment projects, or assisting individual polluters (equitable)	
Less financial impact than full abatement programs; affords firms flexibility; can be used as interim measure (equitable)	

[48]Adapted from concepts in Peat, Marwick and Partners, 1983, pp. III-8 through III-11.

While emission charge systems are not flawless, it is suggested that the advantages listed above clearly outweigh the disadvantages. It follows, then, that emission charge systems are superior to the current system of command and control regulatory practices. This superiority stems from the potential for emissions charges to satisfy our Triple-E criteria: that of effectiveness, efficiency, and equity. In implementing such a scheme, however, it is instructive to consider the delays inherent in the legislative process. And even if the system was created, it is not clear how judicial interpretations would develop over time. Finally, a federal-provincial agreement would be required in order to sort out how authority for abatement programs would be shared or divided across levels of government.

Transferable Emissions Rights[49]

In this system, the "right" to pollute can be bought or sold in a market system. As with C&C systems, the total permissible quantity of a pollutant is determined by the environmental agency. Note that the sole objective of this system is to reduce or eliminate pollution: no revenue is generated. How this upper limit is determined is a function of information availability and is of less import here than the manner in which the integrity of that level is maintained. Table 4[50] highlights the pros and cons of such a system.

The total allowable quantity is divided into equal units (e.g. tonnes per day) and distributed among existing polluters in a given jurisdiction (e.g. Alberta) or to a group of polluters (ex. all carbon emitters)[51] New firms entering the market are required to obtain equivalent emission reductions of the relevant pollutants from existing sources. In this way, total emissions would stay the same or may even be reduced. Pollution sources whose abatement costs per unit (marginal costs) of pollutant removed are high can arrange to pay

---

[49]Also referred to as transferable entitlements or tradable permits in the literature.

[50]Adapted from concepts in Peat, Marwick and Partners, 1983, pp. III-14 through III-21.

[51]The initial distribution may be determined either through free allocations or through an auction or lottery process. A "bubble" or "offsets" system may be used. In the former case, an upper limit is determined for a particular airspace. In the latter, firms may "save up" their rights for use either when expanding operations in the future or for use at different branch location.

polluters whose abatement costs are lower to implement reductions. In effect, the high cost source "buys" extra emission rights at lower costs than he would have to pay if he were to reduce emissions himself.

Table 4: Pros and Cons of Transferable Emissions Rights Systems

Advantages	Disadvantages
An element of certainty about environmental objective (that is lacking in emissions charge system) because upper limits are explicitly stated	Very strict enforcement likely to spur strong lobby groups; may result in compliance delays; legal costs of prosecuting transgressors may be substantial
Does not require specific information about abatement costs, simply sets maximum pollution level and lets trading behaviour induce abatement (efficient)	Organized interest groups will attempt to delay legislation or renegotiate the specified upper limit; could undermine the program or create delays
Whereas emissions charge system requires constant revision of charge rate (due to growth of existing firms and entry of new ones) rights system maintains upper limit. The market will adjust by driving value of emission rights up (efficient)	May not be sufficient number of polluters available to form a market; the US has an advantage over Canada in this regard
If value of emission rights rise, new R&D will be encouraged as firms seek to reduce abatement costs and reduce emissions further (effective)	Mechanism for initial distribution of rights will likely require lengthy negotiations; substantial delay may result
Allows trading to occur between high and low cost abaters; overall costs of control will be lower because low cost emitters have incentive to abate first (equitable)	Transaction costs may be prohibitive

In order for this approach to work "... [t]ransgressors must ... perceive to have a high likelihood of being caught and then be subject to very severe penalties" (Peat, Marwick and Partners, 1984: III-15). As is the case with each policy alternative, we can identify both advantages and disadvantages with tradable emission rights. These are outlined in Table 4. Unlike taxes, a permit scheme in which the government sets the precise total amount of pollution that will be allowed offers a high degree of confidence that emissions control targets will be met or even exceeded.

A Triple-E Approach to Analyzing Policy Options

The preceding analyses of current and alternative abatement policy approaches allow us to make one concrete, albeit simple, conclusion: no system is perfect. Each system embodies both advantages and disadvantages. The problem is exacerbated when one considers the range of policies that is possible *within* each system. But where does this leave us then? It is suggested that while each policy is riddled with difficulties, it is still possible to assess each in a systematic fashion. This is where the Triple-E approach becomes important. If we consider the potential for a policy alternative to be at once effective, efficient, and equitable, we will have come a long way in understanding its potential for aiding in pollution abatement, the first leg of a long run towards sustainability.

Table 5[52] presents a Triple-E analysis of each of the preceding alternatives. It is clear from the Table that C&C systems are inferior on all counts. Similarly, the non-compliance delay penalty system fails the efficiency criterion. Notably, both the emission charge and transferable emission rights systems demonstrate the potential to satisfy all three criteria. Of the four alternatives, and in the context of this thesis, the rights system may be preferred for several reasons. In particular, we should note the flexibility that it affords decision makers and its potential to vest decision-making directly in the hands of polluters. The fact that the tradable rights system is able to empower actors at various jurisdictional levels is key to its appeal. While the central government may legislate national emission standards, the specific manner in which those limits are achieved may be devolved to provincial or even municipal governments.

Ottawa may determine that a given quantity of greenhouse gases may be emitted within each province, leaving provincial governments with the task of how their particular province should comply with that limit.[53] Whether it divides permits equally across industry, auctions them off, or determines another allocation criterion, the point is that control will be vested at a more "local" level—the level that typically has to live with pollution effects, and which can

---

[52]Reprinted, without permission, from Peat, Marwick and Partners, 1983, Exhibit VIII-4.

[53] This option fits neatly with the current emphasis on decentralization and the devolution of powers to the
continued on next page...

most reasonably be expected to consider all of the associated costs of economic activity.

Table 5: A Triple-E Analysis of Pollution Abatement Policy Approaches

Triple-E Criterion	Command and Control Systems	Non-Compliance Delay Penalties	Emission Charges	Transferable Emission Rights
Effective (create incentive to initiate and operate abatement program; conduct R&D)	No	Yes	Yes	Yes
Efficient (ability to achieve least social cost)	No	No	Yes	Yes
Equitable (redistributive effects; incidence of costs on taxpayers, shareholders and consumers)	costs shared by taxpayers, shareholders, consumers not necessarily equitable among polluters	same as C&C	shift to shareholder and consumer shift away from high cost abaters design considerations can mitigate adverse local economic impacts	shift to shareholder and consumer shift away from high cost abaters design considerations can: (i) mitigate adverse local economic impacts and (ii) distribute cost impacts among polluters based on selected criteria

Additionally, the design considerations of this system allow provincial governments to mitigate adverse local economic impacts by allowing them to differentiate among polluters based on

provinces.

selected criteria.[54] This is an important factor, since federally imposed reductions that are applied equally to all provinces, in the name of equity, are in fact often very inequitable. Across the board cuts impose "much larger costs on some agents than on others, and in doing so leads to much higher overall (social) costs" (Wells & Rogner, 1995: 24). With a Triple-E approach, since control is exercised at the level of individual firms, producers can buy or sell permits depending upon their ability to become more environmentally friendly. As well, individuals and community groups could purchase permits in order to prevent firms from doing so. In doing this, pollution could be reduced if community residents were mobilized to generate the requisite funds.

A consistent criticism of this economic approach is the fact that it sells corporations the right to pollute. But while some environmentalists will never accept the utility of an economic instrument which explicitly grants a firm the right to pollute, the fact remains that some form of incentive to encourage environmentally sound behaviour is required. Unless we advocate the wholesale reversal of industrialization, it remains inevitable that pollution will continue. Where we can create economic incentives for firms to implement pollution abatement measures, however, public policy can ameliorate the effects of industrial growth on our natural environment.[55]

While questions will continue as to the appropriate level of pollution standards, the larger issue—that of compliance—will be addressed by a Triple-E approach. Firms exceeding their permit allocation of pollution can be heavily fined. A simple reality check reminds us that firms already pollute, but tradable emission rights (permits) will provide an incentive for firms to internalize the real costs of their pollution. In competing for permits in a supply and demand

---

[54] For example, various areas of pollution activity could be weighted differentially. Whereas an isolated plant in northern Alberta could require a certain number of permits for its emissions, a similar plant located near an urban centre or a parkland could require a higher number of permits for a comparable emission level. This would be similar to the concept of discriminatory pricing, whereby seniors and students are assessed lower costs for certain goods and services than other consumers.

[55] A weakness of the permit system which should be noted is the difficulty which arises with respect to the total size of the market and the transaction costs which are associated with "tracking down" potential trading partners.

driven pricing regime, many firms will be forced to re-evaluate their processes. So while a cap can be put on overall pollution, tradable permits will allow individual firms to make the difficult decisions about how to best operate within that regime.[56]

As firms are continually forced to acknowledge and internalize the real environmental costs of their actions, incentives will exist for the development of new technologies and the continued "greening" of business. Whichever system policy-makers elect to adopt, one thing remains clear. By providing economic incentives that internalize externalities and limit free rider possibilities in an atmosphere of polluter (firm) control and accountability, environmental policy may indeed be able to balance the economic and political pressures that environmentalists and their opponents typically bring to bear on policy-makers.

Conclusion

A Triple-E approach to policy-making and policy analysis with respect to pollution abatement would allow Canadian decision makers to rise above rhetoric and implement policies that transcend mere symbolism. These policies, by definition, would be effective, efficient, and equitable in order to mitigate the negative effects of the economic and political challenges to environmentalism. The key to such policies is that they would allow decision-making authority to be vested at the most appropriate level of government. It is in this regard that Triple-E approaches to policy may help to overcome the existing lack of fit between jurisdiction-of-authority and jurisdiction-of-effect. While the federal government may set environmental standards, each provincial legislature could determine the nature of the implementation and enforcement mechanisms within its own jurisdiction.

Equally important, perhaps, is the fact that firms would have an economic incentive to internalize the real costs of their activities and to re-think the manner in which they do business, a result which would contribute to the broader goal of sustainable development. Triple-E

---

[56] Pollution traders in Chicago say that since receiving Congressional approval six years ago, trading in permits has cut sulphur dioxide emissions in the U.S. faster and more cheaply than expected. Now they are hoping to extend the practice to a wider range of pollutants, including CO_2 -- the largest known man-made cause of global warming. For a summary of the American experience, see Leyla Boulton, 1996. Portions of the article continued on next page...

approaches to environmental policy analysis should not be thought of as panaceas for all environmental difficulties. They do, however, commend unto policy-makers several specific advantages over more traditional regulatory measures:

- they are cost effective in that they provide an incentive to polluters with lower abatement costs to reduce discharges to levels below what would be required under traditional forms of regulation;
- they provide a continuing economic incentive for firms to reduce pollution through new control technologies and processes;
- they can, in certain instances, result in superior environmental performance than would be likely under regulation;
- by assigning the choice of emission reduction option to the firm, rather than the regulator, economic instruments (particularly tradable emissions permits) can more appropriately satisfy multiple environmental objectives;
- they can result in reduced administrative and compliance costs for firms and regulators; and
- a number of economic instruments can more readily accommodate entry into, and growth within, an industry without resulting in emissions growth.

Of course, a host of complicating factors must be considered by policy-makers before deciding which option(s) to pursue. These include the distributional effects of proposed policies on regions and economic sectors; issues related to monitoring and compliance; costs related to transition periods; administrative costs; and the overall effect on domestic and international competition.

Until recently, the use of economic incentives to prevent pollution and foster the principles of sustainable development has been limited in this country. The OECD (1995: 131) has criticized Canada for this fact and supports the notion that:

> New steps should be taken to introduce economic instruments, in conjunction with regulations and voluntary agreements, in environmental management. Promotional efforts at the federal level should be coupled with the actual use of economic instruments at the provincial and municipal levels. A greater emphasis on user charges for services such as water supply and treatment and domestic waste collection would make clear to the consumer the services' full cost and help exert downward pressure on consumption trends.

The report also laments the fact that Canada is moving slowly towards the goal of full cost pricing of public services and suggests that "increasing environmental charges could reduce

---

are re-printed, without permission, in Appendix 5.

budget deficits and improve economic and environmental effectiveness at the same time" (p.133).[57] A Triple-E approach to policy formulation, grounded firmly in economics, has the potential to serve the interests of both business and environmentalists if Triple-E principles are allowed to shape the nature of public policies. In the future, the pursuit of Triple-E policies could facilitate a more comprehensive realization of environmentalism's potential by acknowledging that *each* of the principals in the debate has a role to play in pollution abatement and sustainable development in general. In this regard, it may indeed be possible to reconcile environmental and economic objectives—and to identify a meaningful convergence of the two.

The preceding has shown that while free markets present their own set of challenges, they offer a useful framework for assigning property rights, reducing externalities and encouraging a greater appreciation of the effect that development has on the environment. It is the economic incentives introduced by market instruments that will allow decision makers to design public policies which balance the need for pollution abatement with the need to generate economic growth. But getting pollution under control is only the first step in achieving sustainable development. If we wish to encourage environmentally responsible behaviour in every aspect of human activity, and if we wish to avoid the effects of economic fluctuations upon environmental concern and action, then we will be well served by a more holistic approach to public policy, an approach which seeks to prevent pollution through the search for "greener" alternatives and technologies. In the next chapter, we look beyond our traditional focus on environmental legislation and apply our understanding of incentives and externalities to the vastly greater body of non-environmental legislation which also has massive effects on the environment. The following case study, which examines recent and proposed renewable energy changes within the Canada *Income Tax Act*, serves as an example of such a strategy for achieving long-run sustainability.

---

[57] In Canada, the polluter pays principle is normally used in case of emergencies whereas penalties (non-compliance fees and fines), charges (municipal waste, water consumption, water effluents in industry and air pollution permits) and deposit-refund systems (beverage containers, land restoration guarantees and pesticide containers) have been used to a limited extent in other policies (OECD, 1995: 122-123).

CHAPTER FIVE

Greening Our Non-Environmental Legislation (Energy and the Income Tax Act)

"Our first task will be to conduct a comprehensive baseline study of federal taxes, grants, and subsidies, in order to identify barriers and disincentives to sound environmental practices. We want to promote, not hinder, the research, development, and implementation of clean and energy-efficient technologies; renewable resources; and the protection of biological diversity."
- Liberal Red Book, 1993

"Renewables are heavily disadvantaged by the current federal tax system and if we are going to be able to build projects to supply green kWhrs, we need to have access to sources of capital and a delivery mechanism similar to that enjoyed by oil and gas."
- Jeff Passmore, Canadian Wind Energy Association, 1996

Introduction

The satisfaction of human needs and the pursuit of human objectives is the primary purpose of development. The basic needs of humanity—food, heat, shelter, drinking water, security, jobs and a minimum standard of living—depend upon development through economic growth. As the WCED (1987: 440) warns, "Living standards that go beyond the basic minimum are sustainable only if consumption standards everywhere have regard for long-term sustainability." Yet, it is widely acknowledged that most western societies, including Canada, live beyond the globe's reserve of ecological resources. While the satisfaction of human needs necessitates economic growth, non-sustainable growth limits a society's ability to meet the basic needs of its citizens in the future and endangers the natural systems that support life here on earth. In theory, then, sustainable development has few opponents. Who could argue against such a responsible and reasonable view?

In practice, however, the manner in which we ought to achieve sustainability is less clear. Many industries are able to get away with unsustainable practices simply because public policies are designed with incomplete information, without consideration of institutional factors[58] or without effective compliance measures. Additionally, maintaining the common

[58] This includes the effect of the bureaucracy on policy implementation and the restrictive nature of policy inheritances. It may also include the inability of opposition parties to influence policy when a governing
continued on next page...

good is often difficult when areas of political jurisdiction and areas of impact do not correspond. In Canada, authority over energy policy is divided between the provincial and federal levels of government. Provinces retain ownership of energy resources and develop policies and regulations with which to manage them. Federal jurisdiction mainly covers interprovincial and international movement of energy carriers, taxation and spending measures, territorial and offshore resources and all aspects related to uranium and nuclear substances.

One area where Canada has been identified as living beyond the world's ecological resources is with respect to energy consumption. Accounting for 6 percent of GDP in 1993, the energy sector plays a vital role in the success of our domestic economy. It is also, however, the largest contributor to the country's CO_2 emissions and a large contributor to acid deposition in eastern Canada. Oil and gas production and transport account for 33 percent of the nation's methane emissions and 2 percent of total CO_2 emissions. Coal mining contributes 4 percent of methane emissions and leads to acid drainage from abandoned mines (OECD, 1995: 139). Given this, it is perhaps surprising that successive federal governments have seemed reluctant to respond to demonstrated inequities in the playing field between renewable and non-renewable energy sources. Data show that federal support to the renewable energy sector has traditionally remained far below the levels of subsidies directed to more traditional, non-renewable energy sources (HOC, 1996).

In addition, the House of Commons Standing Committee on Environment and Sustainable Development has acknowledged that the federal tax regime demonstrated significant biases in favour of high-polluting energy sectors, a fact which contradicts the government's stated aim of incorporating the principles of sustainability into Canadian energy policies. Given the federal crown's authority with respect to taxing and spending measures it is unclear why, aside from pressures applied by the oil and mining sectors, Ottawa would have subsidized mineral based energy sources while disadvantaging cleaner, renewable sources.

---

party enjoys a strong majority. Furthermore, well intentioned policies related to taxation and other legislative initiatives impact upon our ability to achieve sustainability and may send the wrong signals both to those

continued on next page...

Indeed, if sustainable development is truly a "process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations" (WCED, 1987: 46), then the federal government ought to have made leveling the playing field a priority years ago.

This chapter provides an inventory of possible changes to the *Income Tax Act* which would encourage environmental protection efforts in the energy sector. It focuses largely on measures resulting in a curtailment of non-renewable resource industries in favour of measures which promote investment in alternative energy technology and development, as well as energy efficiency measures.[59] Drawing upon the work of several government reports,[60] this chapter suggests measures which reflect the principles of sustainability, not through more restrictive environmental legislation, but through fiscal reform. The research is intended to demonstrate that sustainable development goals may also be achieved by looking beyond the traditional approach of legislating environmental standards and encouraging an environmental consciousness by effecting change upon the broad range of non-environmental legislation which also affects the environment. It should be explicitly acknowledged at this point that perversities in tax legislation actually facilitated the unsustainable exploitation of resources in the past. This, quite reasonably, makes some environmentalists suspicious of the suggestion that tax reform can encourage sustainability. It is suggested here that while traditional policies may have been designed to provide a "leg-up" to Canada's fledgling energy industry in previous decades, the time has come to stop encouraging environmentally destructive activity

---

who are polluting and those who are attempting to act responsibly.

[59] Note that the intention of this chapter is not to suggest that renewable energy sources could, or should, be expected to fully replace non-renewables. Indeed, it is unlikely at this time that renewables could provide enough energy for contemporary society (which of course says much about our consumptive patterns, but that is another matter). Rather, it is reasonable to suggest that, insofar as renewables are cleaner and result in fewer environmental interventions, they can augment current sources and facilitate the "wiser" use of both renewable and non-renewables in accordance with the principles of sustainability. In order for this to happen, however, a more level playing field than has traditionally existed is required.

[60] See both Department of Environment and Department of Finance, 1994, and House of Commons, 1996.

and to force firms to internalize the real costs of their business. Indeed, if tax considerations are to be afforded to any firms in the energy sector, environmentalists would offer a compelling argument that those favourable reforms ought to be offered to greener and cleaner firms. This is the essence of the remainder of this chapter.

Many proposed reforms would "give a tax break to taxpayers who engaged in some socially useful activity" (Library of Parliament, 1994: 12). From a policy perspective, it should be noted that tax expenditures are hidden subsidies since the resulting expenditure, or loss of tax revenue, contributes to a higher deficit. In evaluating proposed tax reforms, analysts consider whether the benefit to society derived from the subsidized activity would exceed the foregone tax revenue and whether the reforms would create inefficiencies in economic sectors. Recalling the Triple-E approach to policy analysis that was developed in the previous chapter, we should also expect analysts to ask whether the changes would be equitable and generally parsimonious.

Unsustainable Energy Biases and the Need for Tax Reform

Of the inequities outlined above, the House of Commons Standing Committee on Environment and Sustainable Development (1996: 13) wrote, in *Keeping A Promise: Towards a Sustainable Budget*, that:

> Not only do these tax benefit differentials make the tax system inherently unfair for certain energy proponents, they also run counter to the expressed sustainable development goals of the government, and they place at risk achieving our international commitments to attain environmental progress (e.g. CO_2 reduction).

The tax bias identified in the report points primarily to the restrictive language of flow-through share and specified energy property rule provisions and the indirect subsidies provided to the non-renewable energy industry through the Canadian Exploration Expense (CEE) and the Canadian Development Expense (CDE).

Flow-through Shares and Energy Financing

Of key concern to the development of renewable energy and energy efficiency instruments is the concept of flow-through shares. Flow-through shares are acquired by a taxpayer with

> the understanding that the company issuing the shares will use the proceeds of the share issue to fund a specific investment program. The company also agrees to renounce the relevant expenses in favour of the taxpayer. Thus, for tax purposes, these expenses are considered to be expenses of the taxpayer and not of the company and the taxpayer may deduct such expenses, up to the value of the investment, against his or her income...

That is, through the use of flow-through shares, a firm investing in renewable energy transfers income tax deductions associated with new expenditures to outside investors. In Canada, the use of flow-through shares has generally been limited to the oil exploration and mining sectors, prompting calls for a "level playing field" from representatives of the renewable energy industry.

This entrenched inequity and inefficiency was further exacerbated when, in 1992, the government announced that oil and mining companies would be permitted to reclassify the first $2 million of renounced Canadian development expenses (CDE) as Canadian exploration expenses (CEE) at the rate of 100 percent. Whereas shareholders could previously deduct 30 percent of the expenses renounced, the CEE provision meant that they could now deduct the full 100 percent. Expenses in excess of $2 million were subject to the 30 percent deduction. Insofar as this change to the Income Tax Act stimulated investment in both non-renewable energy activities, it was generally viewed favourably by those industries.

Renewable energy producers have long maintained that the tax treatment of renewable energy and energy efficiency investments ought to be at least comparable with the treatment of other energy investments and with the treatment of other investments in capital assets.[61] Historically, however, renewable energy has been uniquely disadvantaged within the Canadian tax system. Insofar as the 1992 changes tilted the scales even more against renewables, they served to intensify the debates regarding sustainability, effectiveness, efficiency and equity. Prior to the 1996 Budget, no other active business sector nor any other competitive primary energy source faced the same kind of restrictive application of tax incentives to other income as was demonstrated by renewables (HOC, 1996). In an era in which sustainable development is

[61] If sustainability is truly a priority of the government, it can be argued that renewables ought to be treated even more generously by tax regulations than non-renewables are.

a high priority both internationally and domestically, it seems perverse that this type of restrictive language placed renewable energy and energy efficient sources at a competitive disadvantage to other less environmentally friendly sources of energy.

Specified Energy Property Rule

Within the *Income Tax Act*, the Specified Energy Property Rule effectively limited Capital Cost Allowance (CCA) deductions to the income from the energy property. Therefore, it was argued that being unable to utilize the accelerated CCA defeated the purpose of the legislation and formed an effective barrier to a broad investment community of common shareholder investors in such a project or company.[62] Because the CCA was trapped within a project or company, the Specified Energy Property Rule effectively forced the renewable energy or energy efficient producer to either charge an unrealistically high price to the consumer or provide an unacceptable rate of return to their investors. This, of course, was a lose-lose scenario for a renewable energy company because it could not compete with hydrocarbon based energy producers which have historically enjoyed more favourable tax rules.

The one exception to the Specified Energy Property Rule, known as the Principal Business Corporation (PBC) rule, was not seen by the renewable sector as a useful tax incentive. For most tangible property investments in active business, the investor is normally permitted to fully utilize the accelerated CCA in excess of the income generated against other income. However, within renewables, the only type of investor eligible to make use of the CCA was the Principal Business Corporation. This meant that the only practical method by which a renewable energy or energy efficient producer could realize the value of the trapped CCA was by selling all or a portion of its revenue generating asset to a Principal Business Corporation.

This amounted to an unjustifiable penalty to the renewable energy producer who was

[62]An economic analysis of the effect of this rule illustrates a reduction in the CCA write-off rate from the legislated 30% on a declining balance basis to 5% on a straight line basis, assuming a conservative 50% debt
continued on next page...

attempting to maintain ownership of an asset to establish cash-flow and to reinvest in future development. It also diminished the likelihood of attracting suitable investors because there is a limited number of Canadian energy corporations (PBCs) which are taxable. This was exacerbated by the fact that this type of potential investor was often in competition with energy efficient or renewable energy projects in the broader marketplace. Additionally, it was often difficult to motivate prospective investors to redirect their resources from their core business in the petroleum sector where substantially better tax incentives existed.

From this analysis, then, it seems clear that renewable energy or energy efficient producers, under the pre-1996 Budget tax regulations, were denied access to a normal tax incentive delivery mechanism available within other energy classifications. This effectively restricted the ability of companies focused on renewable energy and the pursuit of a sustainable future to finance future growth relative to their less energy efficient, hydrocarbon based competitors in the non-renewable energy sector. Furthermore, the Specified Energy Property Rule created a barrier, denying renewable energy and energy efficient projects the same access to tax deferral financing that was available to competitors in the energy sector and other classes of depreciable tangible assets.

Government Response: Energy and the 1996 Budget

In its March 1996 budget, the federal government announced several measures aimed at leveling the playing field and promoting the principles of sustainable development with respect to renewable and non-renewable energy investments. These budgetary measures were presented as integral components of the baseline review of possible barriers and disincentives to sound environmental practices initiated in the 1994 budget. And while they do not fully satisfy the concerns raised by proponents of renewable energy and energy efficiency investment, the changes do provide a first step towards ameliorating the negative environmental effects of previous tax regimes.

---

financing and no ability to pass accelerated CCA out of the project to equity investors (HOC, 1996).

Extension of Flow-through Shares

First, the application of flow-through share financing was extended from non-renewable energy and mining to specific renewable energy and energy conservation expenditures. This change reflected an acknowledgment of the unfair advantage that had historically been conferred upon the hydrocarbon and uranium sectors.[63] Broadening access to a financing mechanism such as flow-through shares is one means of encouraging the development of renewable energy industries by attracting investors to what is often perceived as a high-risk investment in Canada.[64]

Relaxation of the Specified Energy Property Rule

Second, the Specified Energy property rule was relaxed to enable firms in the manufacturing, processing and mining sectors to apply deductions for renewable energy investments against *all* of their income. Previously, firms whose primary business was not energy-related could only claim Capital Cost Allowance (CCA) deductions against income from the sale of energy—not against their total income. On the other hand, those companies that concentrated on energy production, or that used more than one-half of the energy they produced for their own business could claim deductions against their total income. Providing accelerated CCA for energy efficiency and renewable energy investments should help promote the research, development, and implementation of clean and energy efficient technologies as well as renewable energy use.

The budget also limited, to some degree, the ability of oil and gas firms to access tax expenditures available under the existing tax regime. For example, the provision whereby small oil and gas companies were able to classify up to $2 million in expenditures from a 30% write-off category to one of 100% write-off by reclassifying from CDE to CEE was restricted

---

[63]It is generally acknowledged in the literature, however, that the use of flow-through shares for traditional energy and mining investments has declined since the mid-1980s.

[64]The industry would still like to see the extension of flow-through share financing opportunities to capital costs related to the capturing of the energy resource. For further details, see Canadian Wind Energy Association, June 1996.

to only very small companies, and the threshold was reduced by 50% to $1 million.[65] Note, however, that while this provision was indeed made more restrictive for the oil and mining industries, they still retain a comparative advantage, since the ability to reclassify from CDE to CEE, under any circumstance, still excludes renewables energy development and energy efficiency investments.

Consultations on Future Tax Initiatives

Finally, the budget also proposed consultations on future tax initiatives geared to improving the treatment of additional renewable energy investments. These consultations will consider tax incentives designed to enhance the treatment of additional renewable energy investments, incentives to encourage energy efficiency, and efforts to "repair" environmentally damaged lands. On the latter point, any consequent action improving the tax treatment of funds set aside for reclaiming used lands[66] would represent an extension of the 1994 Budget decision to exempt from taxation the amounts initially set aside within mine reclamation trust funds.

Future Opportunities for Protecting the Environment Through Tax Reform

In the spirit of offering both a critique and suggestions for improvement in tax legislation which affects the environment, the remainder of this chapter will offer a menu of possible tax measures which, if adopted, may offer further support for the principles of sustainable development by encouraging the development of renewable energy and energy efficiency investments. Where appropriate, insight into the economic and political ramifications of a specific reform will also be presented.

From "Full Cost" to "Successful Efforts"

Several possible changes in the Canadian Exploration Expense (CEE) and Canadian Development Expense (CDE) could be pursued with respect to non-renewable energy investments. One scenario would be for the federal government not to provide the 100% write-

[65]A number of additional tax incentives applicable to the industry were also tightened, and minor changes made to the resource allowance, provided to oil and gas and mining firms in lieu of the deductibility of Crown royalty payments.

[66]Examples of such funds include those which set aside monies for reforestation or for the restoration of waste continued on next page...

off of exploration expenditures in cases where the exploration leads to a successful well. Under a benchmark tax system, the base on which tax expenditures are estimated, these exploration costs would be capitalized and then matched against the revenues emanating from oil production from the well.

Under this neutral tax regime, no immediate tax deduction would be permitted. Changing the tax system in this manner could involve transferring this type of deduction away from the CEE and into the less rewarding CDE category, or reducing the current 100% write off on a declining balance basis to 30%. A similar shift could be applied to certain mining-related development costs associated with oilsands and uranium activity.

Opposition to this measure has come from the Canadian Association of Petroleum Producers (CAPP), among others. That organization has produced numbers which show that moving CEE tax treatment to a Successful Efforts basis would lead to a net decline in overall GDP of $535 million and a decline of $85 million in federal tax revenues by 1999 (HOC, 1996). Given the economic ramifications of such a change, it is likely that the alteration of CEE from Full Cost to a Successful Efforts basis would be met with considerable political resistance.

Phasing-Out the CEE and the CDE

Another possible direction is the phasing out of CEE and CDE for energy related investments. It was argued above that these two major indirect subsidies pose serious impediments to any policy seeking to facilitate greater energy efficiency, increased use of alternative energy sources, or reductions in CO_2 emissions. That is, they tend to bias taxation within the energy sector in favour of increased exploration and the development of non-renewable energies. As Tom D'Aquino suggests in Kirton and Richardson (1992), however, it is also true that Canadian public policy operates within the global environment. As such domestic policies may affect a nation's trade relations in the international arena.

Distortions in trade are always possible when environmental standards differ between sovereign states.

---

disposal sites.

> The concern is not so much with international agreements, which might contain trade restrictions as part of their implementation mechanisms, but rather with local regulations, which have an environmental purpose but, explicitly or implicitly, also give an advantage to a local producer over an imported product.

On the other hand, many environmentalists would characterize the structure of Canada's current trade agreements, both GATT and NAFTA, as being destructive to the environment in many ways (Swenarchuk, 1992: 68). This underlines the fact that Canadian public policy can also have the perverse effect of conferring certain disadvantages upon domestic operators seeking sources of international financing.

With respect to the phasing out of the CEE and the CDE, it is likely that Canada would benefit from maintaining its international competitiveness in accessing funds for resource investment. With oil producing competitors such as the United States, the United Kingdom and Norway all providing similar deductions to CEE and CDE (HOC, 1996), our ability to compete for global investment capital would be seriously eroded if the federal government were to tighten up its tax treatment of exploration and development expense. Once again, the resulting decline in investment would have detrimental effects on the domestic economy—a fact which brings to bear another host of political considerations.

Elimination of the "Reclassification from CDE to CEE" Provision

It has already been noted that the 1996 Budget eroded the ability of petroleum and mining-based energy firms to reclassify up to $2 million of CDE as CEE for the purposes of flow-through shares. But, the government could go even further and abolish the provision entirely. This would be consistent with the goal of leveling the playing field, given that proponents of other, cleaner, renewable energy sources do not share this privilege even under the provisions of the 1996 Budget document.

Changes in the Tax Treatment of Investments in Energy Efficiency

Under the current tax rules, energy efficiency investments are not treated in the same manner as are investments to boost energy supply. For example, energy efficiency investments are not beneficiaries of the accelerated write-offs available to energy supply efforts. Moreover, energy efficiency retrofit investments are penalized under the tax system,

since their CCA rate is based on a productive life that is double that of most other energy efficiency assets. Federal tax legislation could be amended to allow for equity in this area of tax treatment.

In its 1994 report, the government-appointed Task Force on Economic Instruments and Disincentives to Sound Environmental Practices noted that it had achieved consensus on the need to amend the *Income Tax Act* to allow owners of residential housing to withdraw, tax free, up to $5, 000 from their RRSPs to finance energy efficiency and certain renewable energy retrofits. Under this proposal, the withdrawn funds would be exempt from tax only if they were reinvested within a certain permissible time period. The underlying hope was that the initial investment in energy efficiency would generate sufficient future energy savings to facilitate reinvestment into the RRSP.

The Task Force argued that this measure would be similar to the Home Buyers' Plan provision in the tax legislation, which enables potential homeowners to access their RRSPs to finance a first home with no tax penalty assessed. It would be beneficial in helping to meet a government's energy efficiency and greenhouse gas emissions objectives, the latter of which has been pledged at the international level. Stipulating energy efficiency could also lead to significant employment effects in a revitalized energy retrofit sector, since it is generally recognized that energy efficiency investments are much more labour intensive than those made within conventional energy industries.

On the downside, this measure would dilute, once again, the government's objective of encouraging private investment planning for retirement—which is, of course, the aim of RRSP tax provisions. For individuals unable to reinvest the withdrawn funds within the allotted time, this tax measure could seriously erode their ability to provide for their own eventual retirement savings requirements.

Conclusion

This chapter has explored tax legislation as it relates to the Canadian energy sector. Given the massive effects that energy development and consumption have on our natural environment, it was reasonable to evaluate the extent to which the *Income Tax Act* promotes the principles of sustainable development in this industry. Notably, the pre-1996 tax regime was largely biased in favour of the non-renewable energy sector and, in several ways, penalized renewable energy development and energy efficiency investments.

The federal government's *Budget, 1996* document acknowledges this perversity and outlines measures which begin the process of "leveling the playing field" in the energy sector. But while this is a positive step, it can be argued that opportunities exist for further tax reforms. In fact, it is suggested that a reorientation of the manner in which the federal government relates to the energy industry in general will be required since the extraction and use of non-renewable energy sources continues to impose net social costs, in terms of environmental efficiency, upon Canadians. And given that world energy needs will increase dramatically by the middle of the next century, by as much as an order of magnitude (Nakicenovic, 1995), the development of renewables will likely figure more prominently in the future.[67]

Furthermore, and more important to this thesis, it is asserted that "green" reforms ought to be extended to the broader swath of non-environmental legislation that has massive effects on our environment. Economic building blocks provide an effective means with which to encourage pollution abatement and sustainable development. It is through using these building blocks to reform both environmental *and* non-environmental public policies that we create the greatest opportunity for avoiding hitting the green wall in the future. In order to reform the relevant policies for sustainability, however, it will be necessary to give serious consideration

---

[67] Nakicenovic also refers to modeling scenarios which suggest that by the middle of the 21st century, the global population will double and economic output will increase 3 or 5 fold from current levels. By 2100, economic output will increase 10-15 fold and the per-capita income gap between currently developing and developed nations will have been eliminated.

to both the economic concepts developed in Chapter 3, the types of policy instruments outlined in Chapter 4 and the concerns of environmentalists raised in Chapters 1 and 2.

CHAPTER SIX

Sustainability and a Green Convergence

"Politics can then be defined as the activity by which differing interests within a given territory are conciliated."
- Bernard Crick, 1992

"We must meet our environmental goals in ways that promote economic prosperity."
- Canada's Green Plan, 1990

"Achieving sustainable economic progress is the greatest challenge facing Canadians and citizens throughout the world."
- Business Council on National Issues, 1992

A greater appreciation of the relationship between the environment and economic growth is emerging in Canada. But even as the quantity and quality of contributions to the relevant literature rises, so too does there persist a lack of agreement on which policy options are most appropriate. Advocates of freer trade continue to regard domestic environmental protection measures with suspicion, worrying that they are potentially offensive to their objectives. Conversely, those who assert the primacy of environmental objectives are likely to express hostility towards trade liberalization (Benidickson, Doern & Olewiler, 1994). In general, however, the literature reviewed in this thesis suggests that the notion of economics and environmentalism being anathema to each other is diminishing. Benidickson, Doern & Olewiler (1994: vii) assert that "[v]arious attempts to achieve a reconciliation of environment and economy, most notably through the concept of sustainable development, are coming to the fore." Furthermore, they suggest that as traditional stereotypes give way to a better understanding of this relationship, proponents on both sides of the issue are realizing the potential benefits of pursuing a mutual co-existence.

An emerging consequence of Pal's "systems thinking," discussed in Chapter 2, is an apparently paradoxical "meeting of the minds" between ecologists and economists with respect to a growing appreciation of market systems. Pal (1992: 273) writes that, while it seems illogical, the application of ecological assumptions can actually lead to *support* for

market systems.

> Market systems are very complex systems in their own right, and defenders of markets have often used arguments that reflect ecological assumptions. Millions of buyers and sellers come together in ways that no one plans, and yet the results are formidable in terms of growth, production, and consumption. Defenders of markets have also argued strenuously that interventions by politicians and governments, in the long run..., upset the ecological balance and impede the market system. Therein lies the appeal of markets: they are systems that can be used to attack the problems of other systems, whether they be domestic poverty, international trading regimes, or the environment. No one controls markets; they operate without central guidance, but this is precisely why they carry the potential to deal simultaneously with a host of factors that would overwhelm a more deliberate policy design.

Recall, from Chapter 1, Pal's definition of public policy as "a course of action or inaction chosen by public authorities to address a given problem or interrelated set of problems." That is, public policy deals with systems, systems which are often served best by the market system primarily *because* it operates largely without central guidance. Since markets are able to deal with the challenges of economic growth, trade, poverty and environmental systems concurrently, we ought not to be surprised by the potential for a convergence of economics and environmentalism.[68]

We have several reasons, then, to believe that efforts at achieving sustainability will meet with success in the future. More notable in this budget year is the fact that as governments seek to reduce the size of their departments there may be an increased need for, and tendency towards, market based policies and their associated lower administrative costs. Also, the finding of common ground between ecologists and economists with respect to a growing appreciation of market systems may make market incentives more palpable to those who would previously have been suspicious of economic instruments.

Given the interdependence of humans in both our economic and ecological systems, the goal of public policy is to mediate between the inevitable conflicts which arise over the

---

[68] Critics will still argue that transactions costs associated with markets are not necessarily lower than those associated with regulations and that the net benefit of this convergence is therefore minimal. It is important to remeber two points, however. First, the imposition of regulations treats all firms the same and forces all firms to accept a particular level of transaction costs. Market instruments, however, give firms an opportunity to adjust their behaviour in order to minimize transactions costs in whatever manner is most appropriate for the individual firm. Second, a reduction in the regulatory nature of business reduces the public costs associated with compliance monitoring, thereby redirecting much of the public share of these transactions costs away from taxpayers and back to the firms which are generating the profits.

allocation of the scarce resources utilized in the pursuit of essential needs. Not surprisingly, the absence of markets for environmental protection has sparked intense debate over the wise use of these resources. In the future, effective public policies will be those that provide a blueprint for fulfilling the expectations of the proponents on *both* sides of the debate. In this regard, it may be that while a tension exists between economics and environmental systems, they remain meshed and interdependent and that the principle of sustainable development helps to create a synergy between the two. And since public policy normally articulates a broad set of principles that guide in the development and implementation of programs, regulations, standards and projects, it follows that policies which offer a multi-pronged approach to achieving these inter-related ends will be useful. If the goal of public policy is to create social institutions which mediate conflicting preferences respecting the allocation of scarce resources among individuals in a society, as suggested in Chapter 1, then market systems provide one framework for doing so.[69]

The emerging emphasis on debt and deficit, decentralization and the protection of the natural environment make this thesis relevant. This thesis has argued that these changes in the Canadian political environment are facilitating a convergence of the principles of economics and environmentalism. But it has also been acknowledged that these changes threaten to diminish the influence of the federal government in the regions. Here, it was suggested that an enduring federal role could be achieved by making use of appropriate economic building blocks—taxes, permits and charges, in addition to voluntary mechanisms—in both environmental policy and the broader volume of non-environmental legislation which has, nonetheless, massive effects on the environment.

The main contribution that this research makes to our understanding of economics, public policy and the environment is as much thematic as it is substantive. It was conceded in Chapter 1 that this thesis will not satisfy those who shun capitalism in general and who use

---

[69] Insofar as it encourages efficiency and enhances the competitiveness of firms, an effective policy which makes use of all of the tools available (regulatory controls, voluntary measures and economic instruments) to achieve

continued on next page...

environmentalism as an instrument with which to attack free market systems. It was also noted that this thesis will not inspire those anti-environmentalists who are concerned only with profit maximization in the short-run. Rather, this research has simply argued that now, more than ever, the Canadian political environment makes it possible to employ both economic and environmental principles in order to attain our sustainability objectives. And while the concepts which have been presented are not new, these changes warranted a revisitation of the arguments that have long been extolled by economists. Finally, this thesis has argued that the emerging emphasis on debt and deficit control, decentralization and the protection of the natural environment speaks to the potential for a convergence of the principles of economics and environmentalism. This convergence will allow us to articulate a framework within which to reform Canadian public policy for sustainability, a framework which will provide our best defense against hitting the green wall in the future.

---

sustainable development also has the potential to encourage investment and promote job growth.

Appendices

APPENDIX 1 [70]

LEGAL PRINCIPLES FOR ENVIRONMENTAL PROTECTION AND SUSTAINABLE DEVELOPMENT

I. GENERAL PRINCIPLES, RIGHTS, AND RESPONSIBILITIES

Fundamental Human Right

1. All human beings have the fundamental right to an environment adequate for their health and well-being.

Inter-Generational Equity

2. States shall conserve and use the environment and natural resources for the benefit of present and future generations.

Conservation and Sustainable Use

3. States shall maintain ecosystems and ecological processes essential for the functioning of the biosphere, shall preserve biological diversity, and shall observe the principle of optimum sustainable yield in the use of living natural resources and ecosystems.

Environmental Standards and Monitoring

4. States shall establish adequate environmental protection standards and monitor changes in and publish relevant data on environmental quality and resource use.

Prior Environmental Assessments

5. States shall make or require prior environmental assessments of proposed activities which may significantly affect the environment or use of a natural resource.

Prior Notification

6. States shall inform in a timely manner all persons likely to be significantly affected by a planned activity and to grant them equal access and due process in administrative and judicial proceedings.

Sustainable Development and Assistance

7. States shall ensure that conservation is treated as an integral part of the planning and implementation of development activities and provide assistance to other States, especially to developing countries, in support of environmental protection and sustainable development.

General Obligation to Co-operate

8. States shall co-operate in good faith with other States in implementing the preceding rights and obligations.

---

[70]Reprinted without permission from that which appears in WCED, 1987, pp. 348-351. The summary is based on the legal formulations in the report to the Commission by the international legal experts group. The full text of the principles and Articles is published in Legal Principles for Environmental Protection and Sustainable Development (Dordrecht, the Netherlands: Martinus Nijhoff Publishers).

II. Principles, Rights, and Obligations Concerning Transboundary Natural Resources and Environmental Interferences

Reasonable and Equitable Use

9. States shall use transboundary natural resources in a reasonable and equitable manner.

Prevention and Abatement

10. States shall prevent or abate any transboundary environmental interference which could cause or causes significant harm (but subject to exceptions provided for in Art. 11 and Art. 12 below).

Strict Liability

11. States shall take all reasonable precautionary measures to limit the risk when carrying out or permitting certain dangerous but beneficial activities and shall ensure that compensation is provided should substantial transboundary harm occur even when the activities were not known to be harmful at the time they were undertaken.

Prior Agreements When Prevention Costs Greatly Exceed Harm

12. States shall enter into negotiations with the affected State on the equitable conditions under which the activity could be carried out when planning to carry out or permit activities causing transboundary harm which is substantial but far less than the cost of prevention. (If no agreement can be reached, see Art. 22.)

Non-Discrimination

13. States shall apply as a minimum at least the same standards for environmental conduct and impacts regarding transboundary natural resources and environmental interferences as are applied domestically (i.e., do not do to others what you would not do to your own citizens).

General Obligation to Co-operate on Transboundary Environmental Problems

14. States shall co-operate in good faith with other States to achieve optimal use of transboundary natural resources and effective prevention or abatement of transboundary environmental interferences.

Exchange of Information

15. States of origin shall provide timely and relevant information to the other concerned States regarding transboundary natural resources or environmental interferences.

Prior Assessment and Notification

16. States shall provide prior and timely notification and relevant information to the other concerned States and shall make or require an environmental assessment of planned activities which may have significant transboundary effects.

Prior Consultations

17. States of origin shall consult at an early stage and in good faith with the other concerned states regarding existing or potential transboundary interferences with their use of a natural resource or the environment.

Co-operative Arrangements for Environmental Assessment and Protection

18. States shall co-operate with the concerned States in monitoring, scientific research and standard setting regarding transboundary natural resources and environmental interferences.

Emergency Situations

19. States shall develop contingency plans regarding emergency situations likely to cause

transboundary environmental interferences and shall promptly warn, provide relevant information to and co-operate with concerned States when emergencies occur.

Equal Access and Treatment

20. States shall grant equal access, due process and equal treatment in administrative and judicial proceedings to all persons who are or may be affected by transboundary interferences with their use of a natural resource or the environment.

III. STATE RESPONSIBILITY

21. States shall cease activities which breach an international obligation regarding the environment and provide compensation for the harm caused.

IV. PEACEFUL SETTLEMENT OF DISPUTES

22. States shall settle environmental disputes by peaceful means. If mutual agreement on a solution or on other dispute settlement arrangements is not reached within 18 months, the dispute shall be submitted to conciliation and, if unresolved, thereafter to arbitration or judicial settlement at the request of any of the concerned States

APPENDIX 2

UNDERSTANDING ALTRUISM IN CANADA

Contrary to what an analysis of neoclassical economics and free riders may suggest, individuals are not concerned solely with their own economic well-being. Often, we achieve utility maximization not only by furthering our own interests, but also by taking the well-being of our neighbours into account (Olson, 1965). In 1992, Revenue Canada identified a total of 61, 554 registered charities. As Table 6[71] shows, almost fourteen percent of registered charities are classified on the basis of providing direct "benefits to the community."[72] Of the 8,483 charities identified in this sector, 979 (11.5%) are closely associated with environmental objectives. Indeed, 689 were identified for their interest in site preservation with an additional 290 concerned with the protection of animals.

A related category within the sector identifies 2, 482 additional entries (30% of the sector) dedicated to "recreation, playgrounds and camps." And while these numbers appear small in comparison to those specific to the sectors of welfare, health, education and religion, they do suggest that Canadians are not only concerned about their communities, but that they are prepared to spend money on addressing community issues — including those that speak to the concerns of environmentalists.

All of this suggests that many people are concerned about the well-being of others and that they are prepared to make economic sacrifices in support of social welfare, education, religion, health and initiatives which directly benefit the community. In fact, registered Canadian charities reported revenues of nearly eighty-seven million dollars in 1992, an amount equivalent to thirteen percent of the nation's 1992 gross domestic product and only slightly lower than British Columbia's gross domestic product for that year (Canadian Centre for

[71] Data reprinted from Canadian Centre for Philanthropy, 1992 (Percentages do not total 100 due to rounding).

[72] This classification label is somewhat misleading since Welfare, Health, Education, religion and "Other" are also assumed to provide benefits to the community.

Philanthropy, 1994). An economic explanation for this behaviour suggests that an altruistic person will give to others "if the reduction in his or her wealth is at least offset by the satisfaction of sharing." (Domingue, 1995: 4).

Table 6: Registered Canadian Charities as Classified by Revenue Canada

Charity Sectors	Public Foundations	Private Foundations	Charitable Organizations	Total Charities	Percentage of All Charities
Welfare	627	1, 000	8, 008	9, 635	15.5
Health	651	214	3, 737	4, 602	7.6
Education	561	662	8, 137	9, 360	15.2
Religion	318	241	27, 327	27, 886	45.2
Benefits to the Community	470	272	7, 741	8, 483	13.7
Libraries & Museums	80	28	1, 345	1, 453	2.4
Military Units	8	10	119	137	0.2
Preservation of Sites	41	11	637	689	1.1
Community Charitable corps.	115	99	83	297	0.5
Protection of animals	9	11	270	290	0.5
Community Charitable trusts	22	32	28	82	0.1
Recreation, playgrounds, camps	69	33	2, 380	2, 482	4.0
Temperance associations	15	12	307	334	0.5
Other community organizations	111	36	2, 572	2, 719	4.4
Other	18415	319	1, 085	1, 588	2.6
Total	2, 811	2, 708	56, 035	61, 554	100.00

APPENDIX 3

THE CHALLENGE OF THE NORTHERN SPOTTED OWL

In 1990, a contingent-valuation survey was conducted in the United States to estimate the value of designating certain forested areas in the Pacific Northwest as "habitat conservation areas." One thousand respondents were surveyed by mail. So began the issue of the northern spotted owl; significant because of its dual role as an endangered species and as an "indicator of the overall health of the...old growth forest" (Tietenberg1994: 63). Depending upon the assumptions economists employed in the study, the calculated non-use value of the forests varied from three times to forty-three times the value indicated by logging.

In the spotted owl example, surveys revealed that the citizenry valued non-use of the forest as much as forty-three times more than they valued logging in the area. Given this, it follows that, in the interest of all concerned, logging should have been banned in the area. Furthermore, there ought to have been widespread support for such a policy. The reality of the situation, however, was depicted graphically on the evening news coverage of the protests which erupted in opposition to the policy. Economic theory proposes an explanation for this apparent inconsistency.

First, the surveys were distributed nationally while the areas under consideration were limited to specific portions of old growth forest in the Pacific Northwest. To what extent the diffuse views of national respondents should have taken priority over the more concentrated interests of the local citizenry, which is financially dependent upon the logging industry, is an issue that is not easily resolved. Second, this difficulty is exacerbated when one considers that the survey asked only about the *perceived* costs versus benefits in the issue. While the benefits of non-use were to accrue to all citizens in the country, it seemed clear that the costs associated with non-use, such as unemployment, reduced tax base, and reduced economic growth, were to be shouldered solely by the local community.

Indeed, it is likely that such costs would have been concentrated on a relatively small group of loggers in a few geographic regions. It is not at all certain that respondents would have demonstrated such strong support for the northern spotted owl if they had been asked to share some of the preservation costs by allocating tax revenues to aid in the transition and to reduce the hardship imposed upon the loggers. As such, preservation of the spotted owl exemplifies the problem of "collective goods" and contributes to our understanding of the challenged which face our public policy-makers.

APPENDIX 4

CRACKING DOWN ON ENVIRONMENTAL CRIMES

The following is re-printed, without permission, from an article by Financial Post reporter Peter Morton, "City Oilman Guilty: Fines of $22 million levied for U.S. environmental crimes," 24 May 1996.

A Calgary oil executive is one of four men who pleaded guilty to criminal environmental charges in the U.S. yesterday. Iroquois Pipeline Operating Co. and four former executives pleaded guilty in a New York state court to the charges, resulting in $22 million US in fines for the company and up to six months of home confinement for the men.

The fines come after Iroquois, which is 29% owned by Calgary-based TransCanada Pipelines Ltd., admitted to a large number of violations of the U.S. Clean Water Act in building a 600k-km natural gas pipeline in the U.S. northeast in 1992. "The widespread nature of the criminal violations is almost impossible to over-state," said Joseph Pavone, acting U.S. attorney in Syracuse, N.Y., who headed the investigation.

The four executives, including TCPL vice-president Robert Reid, faced jail terms of up to one year and fines of $100, 000 US but, in return for lighter sentences, have agreed to co-operate with the U.S. government in its attempt to convict others involved in the pipeline's construction. Reid is expected to serve his six-month sentence at his Calgary home at a later date in a deal arranged with the Canadian government, industry sources said. Neither Iroquois nor TCPL could confirm that a deal with Ottawa had been struck, Reid was in Syracuse and unavailable for comment.

The fine is the second largest environmental settlement in U.S. history, exceeded only by a US$1-billion settlement in connection with the 1989 grounding of Exxon Corp.'s Exxon Valdez oil tanker. Most of the complaints came from the failure of Iroquois to repair 188 wetlands after it built the pipeline. The 10-month construction of the pipeline, which crosses 500 rivers between Iroquois, Ont., and Long Island, N.Y., attracted a large number of complaints about safety and environmental violations.

Iroquois will pay $4 million US to New York state and $18 million US to the U.S. government, part of which will go toward wetland restoration. It has also agreed to return about $20 million US to pipeline customers.

APPENDIX 5

TRADABLE PERMITS: THE AMERICAN EXPERIENCE

Re-printed, without permission, from Leyla Boulton, "For sale: a licence to pollute," in Financial Post, May 7, 1996, p. 14.

Six years after it was approved by the U.S. Congress as part of the Clean Air Act, trading in permits allowing companies to pollute has cut sulphur dioxide emissions in the U.S. faster and more cheaply than expected. Now the architects of pollution trading in Chicago have ambitions to extend the business to a wider range of pollutants. Supporters advocate an international trading system for permits to release carbon dioxide—the best known man-made cause of global warming—into the atmosphere.

Critics may say it is immoral to give companies an explicit right to pollute, but Richard Sander, a former vice-president of the Chicago Board of Trade (CBOT), who launched sulphur dioxide trading argues it injects pragmatism into environmental protection. "It's time to take the environment out of the warm, fuzzy area," he says. "You can't just say, 'I want to save all the dolphins in the world.' You've got to work out how to solve problems in the most cost-effective way."

The way the sulphur dioxide allowance system works is simple. The Environmental Protection Agency issues permits to release the amount of pollution allowed by the Clean Air Act. Most are allocated to power companies, but a few are auctioned once a year by the CBOT to set a price. If plant A gets permits to emit 150, 000 tonnes of sulphur dioxide but wants to emit 155, 000 tonnes, it must purchase an extra 5, 000 allowances—or pay a fine far exceeding the price of the permits. But if the plant is able to cut the emissions further than required, it has surplus allowances. It can either sell the surplus to another plant or save it for future years.

Trading has two main advantages over traditional environmental regulations. It gives the companies a financial incentive to reduce emissions for less than it would cost to buy permits. And, by leaving it to companies to decide how and when to reduce emissions, it

reduces not just the cost of compliance, but the bureaucracy required to enforce environmental legislation.

The EPA reckons emissions reduction through trading has so far cost U.S. industry only U.S.$2.5 billion—half as much as it would have cost under the EPA's traditional regulatory system. The scheme has certainly worked: the U.S.'s 110 most polluting power plants spewed out only 5.3 million tonnes of sulphur dioxide last year, well below a governmental ceiling of 8.7 million tonnes—prompting some environmentalists to say the targets were too lax. The ultimate aim of the program, by progressively reducing the number of permits distributed, is to cut sulphur dioxide emissions to half their 1980 levels by 2010.

Its success has inspired the EPA to consider extending trading to oxides of nitrogen, toxic substances such as mercury, and possibly even particulate dust emitted by long distance haulage trucks....Michael Grubb of the Royal Institute of International Affairs; the London based think-tank, and a member of the IPCC, believes trading could break the international impasse on fighting global warming. Western nations *[including Canada]* are committed to agreeing on national targets for reducing carbon dioxide emissions. But they are divided over how to do it.

Bibliography

Anderson, T. and D. Leal. 1991. Free Market Environmentalism, San Francisco: Westview Press.

Bahro, Rudolph. 1986. "Basic Position of the Greens." In *Building the Green Movement*, trans. Mary Tyler. London: GMP Publishers.

Baker, Brenda. 1992. *Theories of Environmental Ethics and the Moral Status of the Environment*, unpublished speaking notes, Department of Philosophy, University of Calgary.

Bakvis, H. & N. Nevitte. 1987. "In Pursuit of postbourgeois man: Postmaterialism and intergenerational change in Canada," *in Comparative Political Studies*, 20(3), pp. 357-389.

Baumol, W.J. and W.E. Oates. 1979. Economics, Environmental Policy and Quality of Life.

Bell, Daniel. 1978. *The Cultural Contradictions of Capitalism.* New York: Basic Books.

Benidickson, Doern & Olewiler. 1994. Getting the Green Light, Toronto: C.D. Howe Institute.

Block, Walter, ed. 1990. Economics and the Environment: A Reconciliation, Vancouver: Fraser Institute.

Bookchin, Murray. 1989. Remaking Society. Montreal: Black Rose Books.

Boulton, Leyla. 1996. "For sale: a licence to pollute," in *Financial Post*, May 7, p. 14.

Business Council on National Issues. 1992. *Business Principles for a Sustainable and Competitive Future: A Declaration*, Ottawa.

Cairncross, F. 1991. Costing the Earth, Boston: Harvard Business School Press.

Canadian Centre for Philanthropy. 1994. *A Portrait of Canada's Charities*, Toronto.

Canadian Wind Energy Association. 1996. *WindSight Vol. 9., No. 2*, Calgary.

Carson, Rachel. 1962. Silent Spring, Boston: Houghton, Mifflin.

Chant, J., D. McFetridge & D. Smith. 1990. *The Economics of the Conserver Society*, in Block, Walter, ed. 1990. Economics and the Environment: A Reconciliation, Vancouver: Fraser Institute.

Chin, T., Ross Burns, and Sam Fenimore. 1995. *NOVACOR Chemicals Ltd.: A Case Study*, in Ibbotson and Phyper, eds., Environmental Management in Canada, Toronto: McGraw-Hill Ryerson Ltd., pp. 229-246.

Coase, Ronald. 1960. "The Problem of Social Cost," in *Journal of Law and Economics, 3, October*, pp. 1-44.

Cockburn, A., and J. Ridgeway, eds. 1979. Political Ecology, New York: Times Books.

Coleman, W. and G. Skogstad. 1990. Policy Communities and Public Policy in Canada, Toronto: Copp Clark Pittman.

Crick, Bernard. 1993. In Defense of Politics, 4th ed, Chicago: University of Chicago Press.

Cropper, M., and Oates, W. 1992. *Environmental Economics: A Survey*, in Journal of Economic Literature, Vol. XXX, pp. 675-740.

Dales, John H. 1968a. Pollution, Property and Prices, Toronto: University of Toronto Press.

———. 1975. "Beyond the Marketplace," in *Canadian Journal of Economics*, 8 November, pp. 483-503.

Dalton, R. 1984. "Cognitive mobilization and partisan dealignment in advanced industrial democracies," in *Journal of Politics*, 46. pp. 264-284.

Devall, Bill and George Sessions. 1985. Deep Ecology: Living as if Nature Mattered. Salt Lake City: Gibbs Smith, Publisher.

Dewees, D.N. 1980. *Evaluation of Policies for Regulating Environmental Pollution, Working Paper No. 4*, Ottawa: Economic Council of Canada, September.

Downs, Anthony. 1957. An Economic Theory of Democracy, New York: Harper.

———. 1972. "Up and down with ecology—the 'issue-attention cycle'," in *The Public Interest*, 28, pp. 38-50.

Dunlap, R. 1980. "Paradigmatic change in social science: From human exemptions to an ecological paradigm," *American Behavioural Scientist, Vol. 24*, 5-14.

Dunlap, R., and K. Van Liere. 1978. "The new environmental paradigm: A proposed measuring instrument and preliminary results," *in Journal of Environmental Education, Vol. 9*, 10-19.

Dwivedi, O., ed. 1980. Resources and the Environment: Policy Perspectives for Canada, Toronto: McClelland and Stewart Ltd.

Environment Canada. 1996. *Government Response to the HCSC Report on the CEPA Review*.

——— and department of Finance. 1994. *The Task Force on Economic Instruments and Disincentives to Sound Environmental Practices.*

——— and Industry Canada. 1994. *A Strategy for the Canadian Environmental Industry.*

Galbraith, John Kenneth. 1958. The Affluent Society, Boston: Houghton Mifflin.

Gillies, A.M. 1994. Protecting the Environment and Reducing Canada's Debt: Action Plan, Where to Start, Winnipeg: International Institute for Sustainable Development.

Goodin, Robert. 1992. Green Political Theory. Cambridge: Polity Press.

Gordon, Anita and David Suzuki. 1991. It's a Matter of Survival. Cambridge: Harvard University Press.

Gorz, Andre. 1980. Ecology as Politics, trans. Patsy Vigderman and Jonathan Cloud. Montreal: Black Rose Books.

Government of Canada. 1988. Energy and Canadians into the 21st Century, Ottawa: Supply and Services Canada.

———. 1990. *Canada's Green Plan*, Ottawa: Supply and Services Canada.

———. 1992. *Canadian Biodiversity Strategy,* Ottawa: Supply and Services Canada.

———. 1994a. *Taxation Statistics, 1992*, Ottawa: Revenue Canada.

———. 1994b, "Canada's Health Promotion Survey 1990," *in Human Activity and the Environment*, Ottawa: Statistics Canada, pp. 63-65.

———. 1994c. *Human Activity and the Environment*, Ottawa: Statistics Canada.

———. 1995a. *CEPA Review: The Government Response,* Ottawa: Supply and Services Canada.

———. 1995b. *The Toxic Substance Management Policy*, Ottawa: Supply and Services Canada.

———. 1995c. *Pollution Prevention—A Federal Strategy*, Ottawa: Supply and Services Canada.

———. 1995d. *A Guide to Green Government*, Ottawa: Supply and Services Canada.

———. 1995e. *Halifax G-7 Communiqué*, Ottawa: Supply and Services Canada.

———. 1995f. A Guide to Green Government, Ottawa: Supply and Services Canada.

———. 1995g. Pollution Prevention, Ottawa: Supply and Services Canada.

———. 1996. *Budget 1996*, Ottawa: Supply and Services Canada.

Hallman, Ron and Michelle Honkanen. 1995. *Environmentalism, Expanding the Boundaries of Ideological Thought*, in Gibbins and Youngman, eds., MINDSCAPES: Political Ideologies Towards the 21st Century, Toronto: McGraw-Hill Ryerson pp. 141-170.

Hardin, Garret. 1972. Exploring New Ethics for Survival: The Voyage of the Spaceship Beagle, New York: Viking Press.

———. 1968. "The Tragedy of the Commons," in *Science, December 1962.*

Hardin, R. 1982. Collective Action. Baltimore: John Hopkins University Press.

House of Commons Standing Committee on Environment and Sustainable Development. 1995. *It's About Our Health: Towards Pollution Prevention*, Ottawa: House of Commons.

———. 1996. *Keeping a Promise: Towards a Sustainable Budget,* Ottawa: House of Commons.

Howatson, Allan. 1994. *Reforming Public Policies For Sustainability, Report 129-94*, Ottawa: The Conference Board of Canada.

Inglehart, Ronald. 1977. The Silent Revolution. Princeton, NJ: Princeton University Press.

———. 1990. Culture Shift. Princeton, NJ: Princeton University Press.

——— & P. Abramson. 1994. "Economic Security and value change," *in American Political Science Review, 88(2),* pp. 336-354.

International Institute for Sustainable Development. 1994. *Where to Start: Protecting the Environment and Reducing Canada's Deficit.*

Johnson, Lawrence. 1991. A Morally Deep World, Cambridge: Cambridge Univ. Press.

Kanji, M., and N. Nevitte. 1995. *North American Reactions to Environmentalism*, paper presented at "Border Demographics and Regional Interdependency: A Trinational Symposium," Western Washington University, Bellingham, Washington, February 16-18.

Kirton, John and Sarah Richardson, eds. 1992. Trade, Environment and Competitiveness, National Round Table on the Environment and the Economy.

Leiss, William. 1996. *Governance and the Environment, Working Paper Series 96-1*, Kingston: Queen's University.

Lester, J., ed. 1989. Environmental Politics and Policy, Durham: Duke University Press.

Liberal Party of Canada. 1993. Creating Opportunity, The Liberal Plan for Canada (Red Book), Ottawa: LPC.

Library of Parliament. 1987. *Environment, Parliament and Government in Canada*, Ottawa: Library of Parliament.

Library of Parliament. 1993. *NAFTA and the Environment*, Ottawa: Library of Parliament.

Macdonald, D.. 1991. The Politics of Pollution: Why Canadians are Failing Their Environment, Toronto: Mclelland and Stewart Inc.

Morton, Peter. 1996. "City Oilman Guilty: Fines of $22M levied for U.S. environmental crimes," in *Financial Post*, 24 May 1996.

Nakicenovic, Nebojsa. 1995. "Environmentally Compatible Energy Strategies", in *Options, Fall/Winter*, International Institute for Applied Systems Analysis.

Natural Resources Canada. 1994. *Energy Efficiency Regulations —EnerGuide Program*, Ottawa: NRCAN

NEA. 1982. *Disposal of Radioactive Waste -- An Overview of Principles Involved.*

Nevitte, Neil & Mebs Kanji. 1995. "Explaining Environmental Concern and Action in Canada," *in Applied Behavioural Science Review, Volume 3, Number 1*, pp. 85-102.

Noble, Duncan and Robert Swartman. 1995. The Canadian Renewable Energy Guide, Burnstown: The Solar Energy Society of Canada.

OECD. 1995. *Environmental Performance Reviews: Canada, Paris: OECD.*

———. 1980. Pollution Charges in Practice, Paris: OECD.

———. 1991. *The State of the Environment*, Paris: OECD.

Olson, M. 1965. The Logic of Collective Action, Cambridge: Harvard University Press.

Paehlke, Robert. 1989. Environmentalism and the Future of Progressive Politics, New Haven: Yale University Press.

Pal, L. 1992. Public Policy Analysis, Scarborough: Nelson Canada.

Passmore, Jeff. 1996. "Time for feds to use clout," in *WindSight, Vol. 9, No. 1*, a newsletter of the Canadian Wind Energy Association..

Paulson, D., and Denhardt, R. 1973. Pollution and Public Policy, New York: Dodd, Mead & Company.

Peat, Marwick & Partners. 1983. *Economic Incentive Policy Instruments to Implement Pollution Control Objectives in Ontario.*

Peters, Suzanne. 1995. Exploring Canadian Values: Foundations for Well-Being, Ottawa: Canadian Policy Research Networks Inc.

Pigou, A.C. 1918. The Economics of Welfare, London: Macmillan.

Porritt, Jonathon. 1984. Seeing Green: The Politics of Ecology Explained. Oxford: Basil Blackwell.

Porter, G., and J.W. Brown. 1991. Global Environmental Politics, Boulder: Westview Press.

Rose, R. 1993. Lesson-Drawing in Public Policy, Chatham: Chatham House Publishers, 1993.

Rosen, Harvey. 1988. Public Finance, Richard D. Irwin Inc., Chapters 5 and 7.

Safire, William. 1992. Lend Me Your Ears: Great Speeches in History, New York: W.W. Norton and Company.

Sale, Kirkpatrick. 1985. "Bioregionalism - A Sense of Place." *The Nation* October 12:336-339.

Sarokin, D., and Schulkin, J. 1992. "Environmental Economics and Responsibility", in *Environmental Conservation*, Vol. 19, Nr 4.

Schrecker, Ted. 1991. *"Risks versus Rights: Economic Power and Economic Analysis in Environmental Politics,"* in Waluchow and Poff, eds., Business Ethics in Canada, Prentice-Hall Inc., pp. 333-352

Science Council of Canada. 1977. Conserver Society Notes, Ottawa

Sexton, K. 1992. "Cause for Immediate Concern," in *EPA Journal*, March/April, pp. 38-39.

Simeon, R. & Elkins, D. 1974. "Regional political cultures," *in Canadian Journal of Political Science (September),* pp. 397-437.

Smith, Adam. 1937. An Introduction to the Nature and Causes of Wealth and Nations, New York: Modern Library.

Springer, J. & Constantini, E. 1974. *Public opinion and the environment: An issues in search of a home*, in S. Nagel (Ed.), Environmental Politics, New York: Praeger.

Stavins, R. 1992. "Harnessing the Marketplace", in *EPA Journal*, May/June, pp. 20-28.

Swenarchuk, M. 1992. *"The Environmental Community's Perspective,"* in Kirton, John and Sarah Richardson, eds., Trade, Environment and Competitiveness, National Round Table on the Environment and the Economy, pp. 68-69

Swatter, J. 1994. Environmental Politics, New York: St. Martin's Press.

Tietenberg, T.M. 1994. Environmental Economics and Policy, New York: Harper Collins College Publishers.

———. 1995. Emissions Trading, Washington: Resources for the Future.

Tuohy, Carolyn. 1992. Policy and Politics in Canada: Institutionalized Ambivalence. Philadelphia: Temple University Press.

Vogel, D. 1993. *Representing Diffuse Interests in Environmental Policy-making*, in Do Institutions Matter? Washington: The Brookings Institution, pp. 237-271.

Wells, J.D., and H-H. Rogner. 1995. "CO_2 Emission Reduction in Canada: Results from an Energy System Model," in *Energy Studies Review Vol. 7, No. 1.*

World Commission on Environment and Development. 1987. Our Common Future. Oxford: Oxford University Press.

World Values Survey 1990 (Canadian segment)

Index