

"Business-Not-As-Usual: Alternative Policy Instruments for Environmental Management"

Raul Pacheco¹ and Peter N. Nemetz² [Revised February 14, 2001]

Pacheco, R. and P. N. Nemetz (2001). Business-Not-As-Usual: Alternative Policy Instruments for Environmental Management. In: *Proceedings of the 5th IRE Annual Workshop: Addressing the Knowledge Crisis in Water and Energy: Linking Local and Global Communities*, Vancouver, B.C., Institute for Resources and Environment, UBC. Pp. 54-60

Abstract

The purpose of this paper is to provide a cursory examination of the newest policy instruments that may be used in resource management and environmental contexts. Market-based instruments, information dissemination programs and voluntary agreements are briefly described, outlining their relative strengths and weaknesses. Much work is yet to be done to properly evaluate their effectiveness, though they show promise in dealing with complex environmental problems.

Introduction

Studies on non-regulatory approaches to environment and resource management have increased in recent years. The basic underlying rationale of these approaches (greener behaviour) has assumed increased importance. Over-exhaustion of shared resources in situations where government intervention is limited is a concept widely described in the seminal article by Garret Hardin, "The Tragedy of the Commons" (Hardin 1968). Alternative ways to deal with common pool resources problems are addressed in the work of Elinor Ostrom (Ostrom, Gardner et al. 1994) and her research group. Individuals that make use of environmental services and resources are supposed to behave egotistically and pursue their own benefit. According to Hardin's and Meadows' (1972) theoretical works, it is likely that humankind will use natural resources in such an uncontrolled way that resource exhaustion will be quickly reached. Thus, as we are unable to adequately manage our resources, there is a need for government intervention. Therefore, concepts like co-management, multistakeholder consultations, voluntary initiatives and self-regulation become paradoxes. How are we supposed to self-manage our resources if we are about to exhaust our reserves?

In many senses, environmental policy is intrinsically paradoxical. Regulatory agencies responsible for preserving the environment are continuously faced with conflicting values and needs. While sustaining economic growth is an important objective, so is the maintenance of ecological integrity and public health and welfare. Therefore, it isn't surprising that environmental agencies are moving towards innovative forms of environmental policies. This

¹ Ph.D. Candidate, Resource Management and Environmental Studies, The University of British Columbia. Raul Pacheco gratefully acknowledges financial support from the Consejo Nacional de Ciencia y Tecnología (CONACyT)-México for his doctoral studies (1999-2002).

² Professor, Business Economics and Strategy. Faculty of Commerce and Business Administration. The University of British Columbia. The authors also would like to thank Dr. Kathryn Harrison for sharing her work and her contribution to the presentation we delivered at the IRE workshop, February 19, 2001.

paper addresses two of the newest approaches to environmental policy-making: economic instruments and cooperative instruments. The purpose of this paper is to present an overview of these innovative approaches to resource management and to outline on-going research at the Institute for Resources and Environment. Mostly, it is aimed to provide a cursory examination rather than in-depth analyses of a particular policy instrument. However, we aim to draw attention to these approaches and to call for a rigorous research program that addresses their potential strengths and weaknesses.

A typology of environmental policy instruments

Policy instruments are "the set of techniques by which governmental authorities wield their power in attempting to ensure support and effect social change" (Vedung 1998). These instruments are aimed at changing citizen behavioural patterns and ensuring societal modifications of such patterns. Governments make use of these instruments, and the pattern they follow to choose one instrument over another has been the focus of extensive analyses. Most scholars (and regulated firms) agree that regulation has (historically) been the preferred mode for governments to exert influence on polluters (Figure 1). An adversarial and confrontational approach characterized the United States' Environmental Protection Agency (EPA) policy style during the early years (in the 1970s and 1980s). An explanation for this behaviour lies in the commonly held belief that a more stringent approach to environmental protection (more coercive) would yield better results and avoid regulatory capture³. In recent years, however, increased attention has been paid to innovative ways to deal with complex environmental problems. Examples that show this increased interest in the US include SO₂ allowance trading (Stavins 2000), the 33/50 voluntary pollution reduction program (Zatz and Harbour 1999) and Project XL, a pilot program that provides increased regulatory flexibility to achieve better environmental goals⁴. Europe has strongly encouraged de-regulation through the Fifth Environment Action Programme, where a view of "shared-responsibility" between industry and government is held (Khalastchi and Ward 1999). Canadian examples include the Accelerated Reduction/Elimination of Toxics (ARET) program (VanNijnatten and Darier 1996), the National Pollutant Release and Transfer Inventory (NPRI) aimed at disseminating information on toxic releases (Harrison and Antweiler 1999), to name a few. These new approaches tend to have a diminished emphasis on governmental action and coercion and an increased interest in flexible approaches to dealing with pollution. Along a continuum of policy instruments (from more to less coercive), in this paper we distinguish four broad categories: traditional regulation, market-based or economic instruments, voluntary initiatives and information-based programs⁵. We will briefly review these instruments.

Traditional regulation

³ There are several ways to define regulatory capture. A commonly held view states that an industry may "capture" the governmental agency in charge of regulating its activities if the relationship between agency and industry is less independent. This view implicitly assumes that more stringent regulations and more distance between industry and government would be healthier and would make policy more effective. As such, this "conspiracy theory" implicitly calls for a less cooperative approach to policy-making.

⁴ <http://www.epa.gov/projectxl/file2.htm>

⁵ There have been heated debates concerning typologies of policy instruments. We chose to use this particular taxonomy because it allows us to distinguish broadly between coercion, economic incentives, suasion and exhortation for simplicity.

The traditional approach adopted by government for environmental control has been referred to as "command and control"(CAC). Under this approach, regulatory agencies would instruct a company to achieve a specific level of pollutant output for each source of air and water pollution. Frequently, they would specify the control technology to be used. According to the economic literature, three broad sources of inefficiency arise:

Polluters vary in the ease with which they can abate pollution. Therefore, imposing one standard on all is economically inefficient.

The polluter has no incentive to do better than the standard.

Command and control strategies require the regulator to use up resources to acquire information that polluters already possess.

The evolution of environmental policy instruments has been marked by the 1972 policy initiative undertaken by the Organization for Economic Cooperation and Development (OECD), called the "Polluter-Pays-Principle" (PPP). The basic tenet of this policy is that the price of the good or service produced should fully reflect its total social cost of production, including the cost of all resources used (internalizing externalities). Increased interest in market-based instruments has emerged from the PPP. Also, contributing to their popularity is the fact that these instruments decrease (in theory) the level of coercion and intervention exerted by the government.

PPP assumes that:

1. The rational (and efficient) producer is expected to equate marginal costs and marginal benefits (consider in this case marginal social costs rather than marginal private costs).
2. Because of the nature of the marginal cost and benefit curves, it will be rarely optimal to reduce pollution to zero levels.
3. The distribution of additional cost will be split between the producer and the consumer depending on the slope of the demand and supply curves faced by the producer.

Market-based instruments

Economic instruments currently used in OECD countries include: effluent charges (air, water, waste and noise), user charges, product charges, administrative charges (licensing and control), tax differentiation, subsidies (including grants, soft loans and tax allowances), deposit refunds and market creation through emission trading or market intervention. In practical terms, it is necessary to consider an array of selection criteria in choosing economic instruments for pollution control. Of paramount importance is economic efficiency; but this criterion must be tempered with consideration of information requirements, administrative costs, issues of distributional equity, dependability, adaptability, dynamic incentives for continuous improvement, political acceptability and predictability.

Two of the most important economic incentives for pollution control are emission fees and marketable permits. Emission fees force the polluter to internalize his/her externalities, driving

the level of pollution to its social optimum (see Figure 2). Also, they provide an incentive for further reduction in emissions, as reducing the amount of emissions means a reduction in the amount of taxes, creating an incentive for firms to devote funds to R&D on new pollution abatement technology. However, the claim that the risk of evasion would be lower with emission fees is false. The government must continue to monitor at the same (or greater) frequency as before in order to determine the quantity of pollutant to be taxed. It is also extremely difficult to set the appropriate level of tax because of the uncertainty surrounding the actual damage costs associated with any particular pollutant. A pollution tax is less likely to be effective where demand for the final product is price inelastic and/or there are few substitutes available.

As for marketable permits, the basic idea is simple: an acceptable level of pollution is determined for a geographic region. Permits are then issued for the level of emissions (i.e. up to the allowable level according to some procedure that is deemed equitable). The holders of such permits and potential buyers are encouraged to form a market and trade these permits. The underlying theory is that there is an incentive to sell the permits if the marginal pollution control costs are below the ruling price for permits and there is an incentive to buy if marginal pollution control costs are above the permit. System-wide, we would have achieved the most efficient, least cost solution for any desired target level of pollution. In the US, experience with tradeable permits includes SO₂ trading, leaded gasoline and chlorofluorocarbons.

Voluntary initiatives and voluntary agreements

Voluntary approaches have been a recent trend in environmental protection strategies. This style of approaching environmental policy design was a growing trend in the 1990s, as opposed to confrontational styles. These efforts may have been spearheaded by the rise of environmental non-governmental organisations, increased interest in the environment by the civil society and promotion efforts by governmental bodies. For many critics, voluntary initiatives are just a fad that will soon pass. However, faced with increased complexity of environmental issues, governments also need to implement different, new and improved instruments in an effort to ensure environmental protection with a view towards sustainability. It is not, however, difficult to derail voluntary efforts aimed at reducing pollution, increasing habitat resilience and promoting responsible resource stewardship and management. After all, humans have had a long history of irresponsible, careless resource exploitation, sustained pollution of rivers, sewers and aquatic systems and inadequate waste management. Nevertheless, these innovative approaches have also arisen as a response to relative inefficiencies of the business-as-usual scenario. Firms that are highly pollution-intensive may not maintain their operations if sustainable development as a goal is to be pursued. Humankind lives within a bounded, limited ecosphere where resources are scarce and environmental quality is highly dependent on responsible consumption and production. Therefore, new ways to tackle these challenges are required. Voluntary programs belong to this category of instruments.

In this paper, voluntary initiatives, multistakeholder decision-making and information-based instruments are categorised under the label of "suasive" instruments. These instruments aim to modify the behaviour of polluters by providing information, exhortation and moral suasion. They may take (among others) the form of unilateral commitments, bilateral negotiations and/or public

voluntary schemes (Börkey et al 1999)⁶. Please see Table 1 for a few examples of voluntary initiatives.

Information dissemination programs

The US EPA Toxics Release Inventory (TRI) was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA). Considered by the literature on policy instruments as an information-dissemination tool, TRI is a publicly accessible toxic chemical database developed and maintained by the US EPA. Its primary aim is to provide public access to valuable information on how much toxic material is released by manufacturing activities. It is argued that interest groups, NGOs and other political actors would then be able to use this information in order to achieve better environmental protection goals. Increased awareness about the amount and toxicity of chemicals released into the environment is expected to provide a basis for galvanizing public opinion, which will in turn demand better waste management activities from industrial firms.

The nature of this policy instrument is mandatory. Section 313 of EPCRA specifically requires manufacturers to report releases of a number (over 6000) of designated toxic chemicals to the environment. These reports are then submitted to the US EPA and state governments. EPA compiles the data and publishes it online⁷.

Any manufacturing facility with 10 or more full time employees that manufactures or processes 25,000 pounds (or otherwise uses 10,000 pounds) of a toxic chemical during a given calendar year must file EPA Form R for each chemical processed (Bunge, Cohen-Rosenthal and Ruiz-Quintanilla 1996).

Despite its mandatory (traditional regulatory) nature, TRI is considered an information dissemination instrument because it is expected to increase awareness and mobilize interest groups and other relevant political actors to exert pressures on industrial firms to reduce their emissions. Changes in incentive structures in information-based programs such as the Pollutant Releases and Transfer Registries (PRTRs) like TRI are supposed to be driven by the impact of information dissemination on target groups. By being able to access pollutant release data, citizens can mobilize resources and increase political pressure on firms to reduce their waste production.

Potential advantages of TRI include:

- Availability of information on toxic releases to relevant stakeholders
- Widespread dissemination of information related to toxic chemical releases and off-site transfers
- Increased public awareness of industrial pollution and its impacts on the environment

However, potential disadvantages of TRI also arise. Among these:

- End users (citizens and relevant stakeholders) may not be able to readily access the data.

⁶ Typologies of environmental policy instruments and voluntary initiatives are abundant in the literature. We chose the OECD's classification (Börkey et al 1999) for simplicity.

⁷ Data are available through the EPA website: <http://www.epa.gov/tri/general.htm>

- Even if published documents are accessed, there is a strong chance that expert knowledge is needed to interpret toxicological and epidemiological data related to each chemical compound.
- The possibility of illegal dumping of hazardous waste makes these instruments more costly because of costs of monitoring and enforcement.
- TRI reports reflect releases of chemicals, not human exposures to these substances. Therefore, it is more difficult to make valuable use of available reported data.

As it will be argued later, evaluation frameworks for information-based and voluntary initiatives are difficult to generate because there are a number of issues that cannot be addressed in a simple manner. When trying to compare "business-not-as-usual" situations (where the program is in place) with "business-as-usual" situations (where the program has not been in place), rigorous evaluations are difficult to obtain. Therefore, environmental improvement as a result of the implementation of a voluntary program or an information-dissemination instrument is hard to prove because the causal link is difficult to trace.

The Canadian version of TRI, the National Pollutant Release and Transfer Inventory (NPRI) was created in 1992 and launched in 1993, mostly as a result of policy transfer and learning from the US experience. It aims to "provide Canadians with information on pollutants released to their environment"⁸. Results are seen as most encouraging. Also, the OECD and the United Nations Environment Programme (UNEP) have contributed to promoting these efforts, suggesting that national governments should adopt these strategies as innovative ways to address hazardous waste management issues. These programs increased their popularity up to the point where they were specifically incorporated into the text of Agenda 21. Principle 10 of Agenda 21 clearly states that states should facilitate and encourage public participation through information dissemination (WCSD, 1992).

PRTRs have also disadvantages, though not very well explored empirically. In one of few analyses of NPRI data, Harrison and Antweiler (1999) have made a strong case that a large percentage reduction in releases and off-site transfers of NPRI chemicals is largely due to traditional regulation as opposed to the result of information dissemination and interest group mobilization. They show that most of the reductions may be attributable to traditional government intervention and few to stakeholder pressure. Moreover, they argue that one of the great advantages of NPRI (yet often overlooked) has been its ability to provide a means to identify how successful regulatory regimes have been in reducing emissions.

Despite criticism of these publicly-accessible databases, success stories have also been highly publicized, and the international trend shows an increased interest in PRTRs. There are now other countries that have adopted emissions inventories that follow the schemes of NPRI and TRI. Mexico, for example, started tracking data on emissions and pollutant releases in 1996. However, not all PRTRs work equally. A case has been made, for instance, that Mexico should adopt a mandatory reporting scheme, because at the moment, industrial firms in Mexico do not have to report to the RETC (Registro de Emisiones y Transferencia de Contaminantes); they do so on a voluntary basis. This situation may be viewed by some critics as problematic, because

⁸ Environment Canada's NPRI website <http://www.ec.gc.ca/pdb/npri>

the non-mandatory nature of the Mexican RETC does not allow for cross-national comparisons, which was clearly an objective of OECD. The Mexican experience with PRTRs has been relatively scarce. However, some progress has been made. Also, not only North American countries are implementing PRTRs. The UK, Australia and the Czech Republic also have started designing and implementing this type of program.

Evaluation of Alternative Policy Instruments

An evaluation of the potential for success of these cooperative processes is, in theory, possible. However, most authors that have tried to evaluate the success or failure of these processes have encountered problems. It is hard to determine causal relationships among variables that are related to participation in voluntary programs. One of the most important questions that remains unaddressed is what it takes for a voluntary initiative to be successful. Moreover, what is success? How do we measure the success of a voluntary initiative? What variables influence the outcomes of these approaches? These questions have been examined in the literature yet no conclusive results have yet been obtained.

Also to be considered:

- Levels of pollution reduction may not be causally linked to the use of a particular voluntary program.
- Data may be sparse or unavailable (may be the case in many countries that have low enforcement standards).
- It is difficult to decide on objective criteria for evaluation.

Conclusion

Any realistic system of pollution control is going to require a mix of instruments. No one instrument is best in all situations. CAC may be preferred in many situations because less information is required to introduce regulations, it can be depended upon to achieve a pre-specified policy target and it has a high degree of acceptance. Traditional regulation is required in situations where compliance is absolutely necessary and/or required on short notice, and in situations of high scientific uncertainty about possible pollution-related environmental damage.

While many believe that traditional regulation has led the way in Canadian environmental policy for many years, analyses of the Canadian Green Plan by Hoberg and Harrison (1994) showed that the majority of the policy instruments outlined in the Green Plan were less coercive than traditional regulation. Hoberg and Harrison (1994:128) found that a surprisingly high percentage of instruments were aimed at disseminating information and very few were targeted at imposing a regulatory regime (56% vs. 12% in the initial Green Plan). Similar analyses are not readily available in the US or the European Union. However, a case has to be made for the need for rigorous evaluation and testing of market-based, informational and voluntary instruments. Moreover, alternative policy instruments should be viewed as a complement, rather than a substitute for traditional regulation. Until the time comes when human beings collaborate altruistically to share resources and work together towards a sustainable future, a mix of regulatory and non-regulatory approaches may be the best approach to environmental policy-making.

References

- Bunge, J., E. Cohen-Rosenthal, et al. (1996). "Employee Participation in Pollution Reduction: Preliminary Analysis of the Toxics Release Inventory." Journal of Cleaner Production 4(1): 9-16.
- Börkey, P., et al. (1999). Voluntary Approaches for Environmental Policy in OECD Countries: An Assessment. Paris, CERNA, Centre d'Economie Industrielle.
- Hardin, G. (1968). "The Tragedy of the Commons." Science 162: 1243-1248.
- Harrison, K. and W. Antweiler (1999). Environmental Regulation vs. Environmental Information: A View from Canada's National Pollution Release Inventory. Annual Meeting of the Association for Public Policy Analysis and Management, Washington, D.C., APPAM.
- Hoberg, G. and K. Harrison (1994). "It's Not Easy Being Green: The Politics of Canada's Green Plan." Canadian Public Policy 20(2): 119-137
- Khalastchi, R. and H. Ward (1998). "New Instruments for Sustainability: An Assessment of Environmental Agreements Under Community Law." Journal of Environmental Law 10(2): 257-290.
- Ostrom, E., R. Gardner and Walker, J. (1994). Rules, Games, & Common-Pool Resources. Ann Arbor MI, The University of Michigan Press.
- Stavins, R. N. (2000). "Experience with Market-Based Environmental Policy Instruments." RFF Discussion Papers 00(99).
- VanNijnatten, D. and E. Darier (1996). Lessons Learned from ARET: A Qualitative Survey of Perceptions of Stakeholders. Kingston, ON, Environmental Policy Unit, School of Policy Studies, Queen's University.
- Vedung, E. (1998). Policy Instruments: Typologies and Theories. Carrots, Sticks & Sermons. Policy Instruments & Their Evaluation. M.-L. Bemelmans-Videc, R. C. Rist and E. Vedung. New Brunswick, Transaction Publishers: 21-58.
- Zatz, M. and S. Harbour (1999). "The United States Environmental Protection Agency's 33/50 Program: The Anatomy of a Successful Voluntary Pollution Reduction Program." Journal of Cleaner Production 7(1): 17-26.

Tables and Graphs

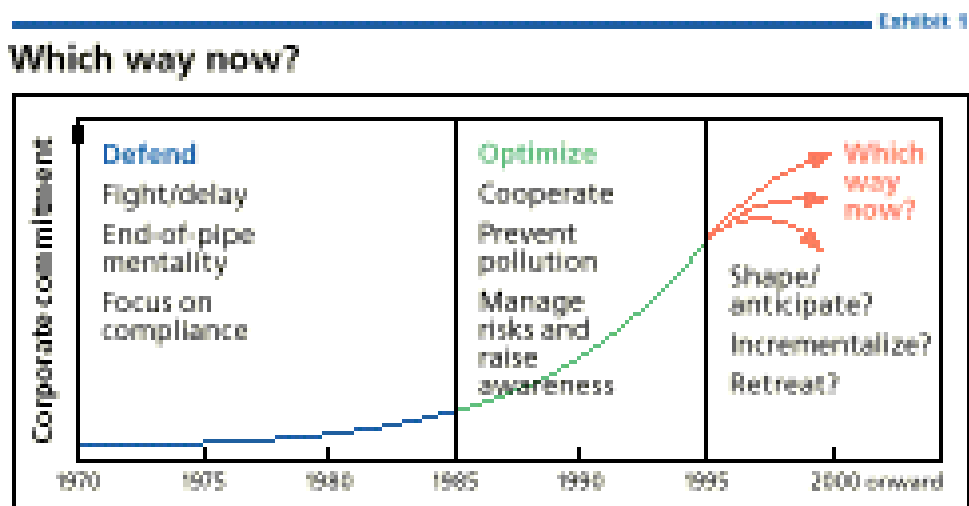


Figure 1. Trends in Environmental Policy (From Christensen, Paul D. (1995) "The environment: It's not time to relax" The McKinsey Quarterly Number 4:148).

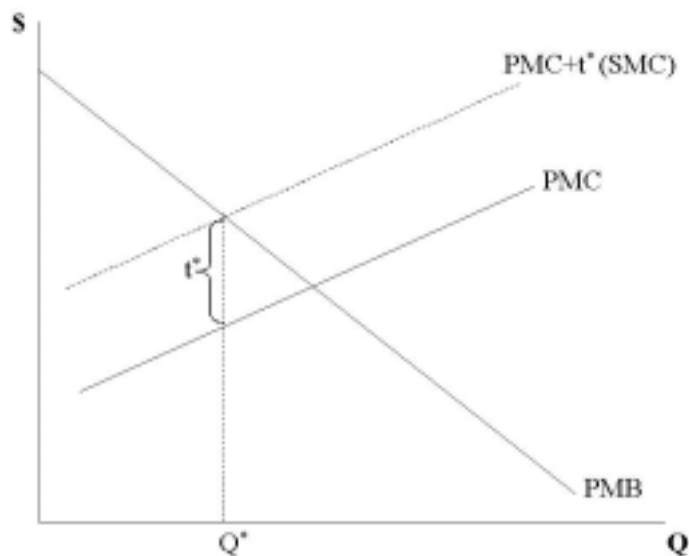


Figure 2. The effect of an emission tax on social and private marginal costs.

<i>Initiative</i>	<i>Key Participants</i>	<i>Scope</i>	<i>Characteristics</i>
EPA's 33/50 Programme (US) ⁹	EPA Industrial firms	Reduction in releases of 17 priority chemicals by 33% in 1992 and by 50% by 1995 in the US	Government-initiated project. Challenge where firms participate voluntarily
ARET ¹⁰	Industry representatives Environmental NGOs Health and professional groups Government groups	Accelerated Reduction-Elimination of Toxics in Canada Two stage program Multistakeholder consultation on criteria and target substances Challenge to achieve a 50% to 90% reduction of toxics by 2000 through voluntary means	Government-initiated project. Multistakeholder consultation and voluntary initiative Challenge where firms participate voluntarily
National Task Force on Packaging ¹¹	Industry representatives Non profit organizations Government rep.	Creation of a National Packaging Protocol through multistakeholder consultation in Canada. Reduction of 50% in solid waste generation by 2000.	Government initiated. Multistakeholder consultation Voluntary commitment to comply
Whitehorse Mining Initiative ¹²	Industry representatives Environmental NGOs Government representatives Aboriginal groups	Develop a national sustainability policy for the mineral sector. Created as a response to structural problems in the mining industry. Canada-wide program	Industry-initiated. Multistakeholder consultation.

Table 1. A Few Selected Collaborative Initiatives (constructed from various sources)

⁹ From Zatz and Harbour (1999)

¹⁰ From VanNijnatten and Darier (1996) with Leiss

¹¹ From VanNijnatten (1996)

¹² From McAllister and Alexander (1997)