CULTURE AND HISTORY COUNT: CHOOSING ENVIRONMENTAL TOOLS TO FIT AVAILABLE INSTITUTIONS AND EXPERIENCE

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"I think the lesson we've learned [in the former Soviet Union] is that *. . . issues of governance, issues of legal infrastructures, issues of institutions are absolutely central . . . .*"[1]

I. A BACKGROUND TO ENVIRONMENTAL CHALLENGES FACING DEVELOPING COUNTRIES

It is not good enough to provide policy advice to the developing world on the basis that the policies must work because theory says they should work. The stakes are too great. Joseph Stiglitz has made this clear in a different context—the reforms urged by the international financial institutions (IFI)—where he has pointed out that policy advice should not be confused with technocratic or engineering solutions. "Technocrats can, of course, make an electricity plant work better—to produce electricity at as low a price as possible. This is mostly a matter of engineering, not politics. Economic policies . . . involve trade-offs . . . ."[2]

These insights are equally applicable when the recommendations are for environmental policy instruments in the developing world and countries in economic and political transition. Although policy instruments are often referred to as tools, or part of a tool chest, the analogy of an "instrument" or "tool" misleadingly implies the construction of a physical edifice (apply this hammer to that nail). In fact, no effort to establish programs to control pollution can be

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1. Robert Lyle, *Has Transition Failed in the Former USSR?*, UKRAINIAN WKLY., May 16, 1999, *available at* http://www.ukrweekly.com/Archive/1999/209904.shtml (quoting Joseph Stiglitz, then Senior Vice President and Chief Economist of the World Bank) (emphasis added).

2. Joseph Stiglitz, *Don't Trust Technocrats*, GUARDIAN, July 16, 2003, *available at* http://www.globalpolicy.org/socecon/bwi-wto/imf/2003/0716trust.htm. Stiglitz goes on to say that "few policy choices are Paretian. Instead, some policies are better for some groups, but worse for others. . . . Deciding which policy to choose involves choices among values, not just technical questions about which policy is in some morally uncontroversial sense 'better'. These value choices are political choices, which cannot be left to technocrats." *Id.*

compared to a simple construction project. The success of any offered policy advice requires a deep understanding of the local context in which the policies are to be applied, including the formal system of laws and regulations and the "informal constraints" and habits of "human behavior, such as conventions, attitudes and norms."[3]

Environmental tools are heavily value laden and context specific. Often, particularly in the western democracies, environmental tools have been developed in complex legal and regulatory contexts, balancing the needs and interests of a wide variety of stakeholders and interest groups with considerations such as acceptability, as well as affordability.

As developing countries undertake to develop tools to control and combat pollution, they often look to the West for regulatory ideas. The donor community has been quick to recommend particular tools for use in the developing world that have worked in, for example, the United States or Western Europe. It is generally agreed that any effort to become effective environmental regulators normally begins with the development of environmental laws, and as a result, many, if not most, developing world countries have relatively well-developed environmental laws on their books. Some of these laws are quite general or provide direction so unclear that compliance is very difficult. But even where laws are clear and complete, few of the laws or the approaches enshrined in the laws have led to reliable enforcement or good compliance at the source level in the developing world. This has been the subject of much soul searching.

I believe that these failures can be connected back to the fact that regulatory ideas are often promoted without at the same time providing much contextual information. This statement is true for the whole range of available environmental tools, conventional and market-based/market incentive instruments (MBIs). But MBIs pose a special problem. While most conventional tools have been used for some years, many recommended MBI approaches that would harness the market in one way or another have not yet been road tested, even in the advanced western systems of environmental regulation. Environmental development advice is, at best, suspect when the recommended tools have a limited track record or even are a product of academic conjecture rather than real experience.

The purpose of this Article is to initiate a dialogue on how best to move toward the shared goal of cleaner air and water, and how to add greater elements of realism into instrument selection. In the long term, we (the world community and the providers of development assistance) are trying to reach at least two hard-to-attain goals: 1) to develop a common understanding of what issues need to be discussed to consider how to move the discussion about environmental tool selection in the developing world from theory to practice; and 2) to try to think how one can go about identifying the institutions, culture, and habits necessary to support tools for environmental control including MBIs.

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3. Patrik Söderholm, *Environmental Policy in Transition Economies: Will Pollution Charges Work?*, 10 J. ENV'T & DEV. 365, 374 (2001) (citing DOUGLASS NORTH, INSTITUTIONS, INSTITUTIONAL CHANGE AND ECONOMIC PERFORMANCE (1990)).

All together, this requires very concrete, fact-grounded discussion. It takes a considerable amount of work to determine whether the tools and mechanisms that have worked well in one context are achievable in another, and whether tools and experience from one system can be transplanted to another, regardless of whether they are conventional or market-based. Because policymakers from the developing world have an obligation to their own constituencies and they have limited resources, they need to understand the full picture. There are considerable costs to chasing dreams.

A. Obstacles to Effectively Managing Pollution

The developing world does not have a strong track record of environmental protection for the control of pollution. The environment came onto the world agenda in 1972 at the United Nations Conference on the Human Environment in Stockholm. In the thirty-two years since then, almost every country in the world has developed formal measures in the form of laws and official institutions (environmental agencies and ministries) toward environmental protection. This has been a major triumph in the sense that environmental policy and efforts to control pollution now have global visibility. However, the sad part of the story is the overall lack of effectiveness of these efforts.

It is fascinating, and troubling, to read reports from the early 1970s on the environmental problems needing attention in the developing world. Many of those reports could have been written today. They indicate that, despite much energy and investment, including environmental policy-related official direct assistance by developed countries in developing countries and countries in transition, little has changed in terms of policy impacts, institutional reform, and environmental improvement. The picture is similar to what the U.S. Council on Environmental Quality projected in 1980 under its "business as usual" scenario. Environmental indicators all point toward continuing deterioration.

In fact, these problems are compounded by new stresses from disease, war, population, and energy and water shortages.[4] Most environment ministries remain weak, hardly more than symbolic institutions, with little influence over their more powerful sister ministries. Their existing and often comprehensive laws may include ideas from U.S. environmental regulations, initially conventional, or so-called "command-and-control" tools, and, more recently, MBIs.

It is not the purpose of this Article to discuss specifically why these environmental regulations have not proven effective, but only to note that the sluggish pace of environmental protection is commonly attributed to numerous factors: limited resources and personnel; perceived conflicts between environmental and economic goals; inadequate training or experience in self-government; corruption; low-functioning legal systems; pervasive cynicism; and a basic mistrust toward government. In this poisoned atmosphere, the challenge

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4. Occasionally, environmental protection is aided by economic failure, such as the closure of nonproductive industries in Central and Eastern Europe following the fall of the Soviet Union.

of developing effective laws and the kinds of consensus and alliances necessary to solve environmental problems is considerable.

B. The Case for MBIs

Environmental policymakers and analysts are understandably frustrated by the conditions described above.[5] A number of people, particularly environmental economists, have argued that implementation problems can be bypassed by the introduction of MBIs, such as emission taxes and tradable permits.

They argue that where technical environmental expertise and political will is missing, instruments that capture and harness behavioral motivations shaped around neo-classical economic theory can get to the goal of reduced pollution more efficiently and quickly. The MBI advocates contend that these tools can increase economic efficiency, improve and decentralize decisionmaking about control options, provide greater incentives for technological change, and lower overall compliance costs. They support these arguments with experiences from the United States, particularly emissions trading programs for sulfur dioxide (SO_2) and nitrogen oxides (NO_x), in which polluters use the motivation of economic self-interest to sort out how they can, as a whole, reach pollution goals set by the government.

The most enthusiastic MBI advocates argue that countries can by-pass more traditional regulatory approaches, or that adoption of economic instruments might even eliminate the need for regulatory bodies and enforcement programs altogether.[6] Another argument that came in vogue is that MBIs are the logical end point of leapfrogging, i.e., that countries could examine the environmental regulatory mistakes made by the developed economies and "leapfrog" over them to more efficient solutions.

These arguments were particularly popular in the donor community in the 1990s and were the basis for much donor activity. There is no doubting the potential value of economic instruments in the appropriate technological and institutional circumstances as a way to reduce the overall costs of attaining environmental goals by minimizing compliance costs. However, the MBI

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5. Their concerns are heightened as some donor countries and organizations have turned their attention away from the environment. As a result, there have been attempts within the environmental policy community to recast the environmental debate to give it greater urgency, for example as a security issue.

6. Theodore Panayotou of Harvard University has argued that economic instruments take full advantage of the self-interest and superior information of producers and consumers without requiring the disclosure of information or creating large and costly bureaucracies. Thus, he has argued that economic instruments as a group substitute for efforts to enforce compliance and "tend to have lower institutional and human resource requirements than command and control regulations." THEODORE PANAYOTOU, ECONOMIC INSTRUMENTS FOR ENVIRONMENTAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT 52 (United Nations Environment Programme, Environmental Economic Series Paper No. 16, 1994), *available at* http://www.conservationfinance.org/Documents/CF_related_papers/panyouto_econ_instru.pdf.

advocates have found themselves in a dilemma similar to the efforts they criticized, despite a considerable amount of effort and many planning exercises and studies, MBIs are not making much progress in reducing pollution in the developing world.

There is now growing literature questioning whether MBIs can work as easily as the claims made for them.[7] The main arguments against MBIs are rooted in institutional realities, much like the arguments Stiglitz has made in the context of international financial institutions (IFI) economic reform advice: most of the countries of the developing world have barriers to the adoption of these instruments in the form of low functioning legal systems, historical inexperience with markets as the West conceives them, distorting and often institutionalized corruption, and, quite simply, very different behavioral habits and customs that cause developing countries naturally to seek solutions other than those dictated by considerations of efficiency or price. While these institutional inadequacies and differences in approach can, in principle, be turned around, changing long standing habits and ways of thinking can be a long and arduous process. They represent very fundamental obstacles.

The discussion above is by way of background only. This Article does not try to resolve this debate about which tools have the best chance of succeeding. Instead, its purpose is to try to identify and examine various institutional

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7. *See generally* MIKAEL SKOU ANDERSEN, ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, ECONOMIC INSTRUMENTS AND CLEAN WATER: WHY INSTITUTIONS AND POLICY DESIGN MATTER, (2001), *available at* http://www.sigmaweb.org/pdf/PUMACOG_CleanWater00E.pdf; Ruth Greenspan Bell & Clifford Russell, *Ill-Considered Experiments: The Environmental Consensus and the Developing World*, 24 HARV. INT'L REV. 20 (2003); Ruth Greenspan Bell, *Monitoring International Greenhouse Gas Emissions Trading*, 25 BNA DAILY ENV'T REP., ANALYSIS & PERSP. 806 (2002); Ruth Greenspan Bell & Clifford Russell, *Environmental Policy for Developing Countries*, 18 ISSUES IN SCI. & TECH. 63 (2002), *available at* http://www.issues.org/issues/18.3/greenspan. html; Daniel H. Cole & Peter Z. Grossman, *Toward a Total Cost Approach to Environmental Instrument Choice*, *in* 20 RESEARCH IN LAW AND ECONOMICS: AN INTRODUCTION TO THE LAW AND ECONOMICS OF ENVIRONMENTAL POLICY: ISSUES IN INSTITUTIONAL DESIGN 225 (T. Swanson & R. Zerbe eds., 2002) [hereinafter Cole & Grossman, *Toward a Total Cost Approach*]; Daniel H. Cole & Peter Z. Grossman, *When Is Command-and-Control Efficient? Institutions, Technology, and the Comparative Efficiency of Alternative Regulatory Protection*, 1999 WIS. L. REV. 887 (1999) [hereinafter Cole & Grossman, *When Is Command-and-Control Efficient?*]; Clifford Russell & William Vaughan, *The Choice of Pollution Control Policy Instruments in Developing Countries: Arguments, Evidence and Suggestions*, *in* 7 INTERNATIONAL YEARBOOK OF ENVIRONMENTAL AND RESOURCE ECONOMICS 331 (H. Folmer & T.H.Tietenberg eds., 2003); Söderholm, *supra* note 3; Ruth Greenspan Bell, Choosing Environmental Policy Instruments in the Real World, Paper prepared for the OECD Global Forum on Sustainable Development: Emissions Trading, Concerted Action on Tradeable Emissions Permits Country Forum (Mar. 17-18, 2003), *available at* http://www.oecd.org/dataoecd/11/9/ 2957706.pdf; William D. Nordhaus, After Kyoto: Alternative Mechanisms to Control Global Warming, Presentation at National Bureau of Economics Conference (Oct. 23, 2002), *available at* http://www.nber.org/~confer/2002/pef02/nordhaus.pdf.

elements that affect how any environmental tool might work, with particular emphasis on how to genuinely develop market based solutions, and to set up a framework for further work. The Article starts by identifying and discussing a series of relevant factors and institutional or organizational themes. The list is not necessarily conclusive nor is it presented in any sort of taxonomic order. Hopefully, further work will both expand the list and fill in the details of a workplan to address these issues.

II. The Legal System and General Legal Culture as a Framework for Managing Environmental Pollution

The framework within which any environmental tool works is the prevailing legal system and legal culture. Most tools are incorporated into practice through laws, and often we assume that writing a law is sufficient to institute good practice. Unfortunately, laws have different meanings and significance in different societies. This section examines whether it is possible to rely on law creation to institutionalize specific practices in all societies.

A. What Is the Role of Law in Society? Is It More Than a Formality?

For this discussion, I have grouped countries in three general categories, but all of the distinctions are matters of degree: 1) countries that are genuinely law based (although there may be matters of degree about how faithfully or promptly laws are implemented); 2) countries that have historically had laws but where the laws are overshadowed by informal, much more powerful, decisionmaking processes; and 3) countries that historically have had little or no experience with written laws.

Some countries are or have become genuinely law-based. For historical reasons in those countries, law is the governing principle in the formal relationships between people and between people and government, and laws get their "bite" from courts that have the power to force compliance with them. The United States is in this category; indeed, it has been criticized on the basis that too many trivial disputes end up resolved through formal legal processes.

On the other hand, with some exceptions, it is reasonable to suppose that an environmental law, once enacted, will be complied with in these countries. If it is not, interest groups and stakeholders can use available legal mechanisms to assure that the failure to implement and enforce will be brought to a court for resolution. Much of the regulatory agenda of the U.S. Environmental Protection Agency (EPA) is defined by court-ordered schedules that require the Agency to issue regulations to implement specific laws. In addition, in the United States, citizens rather than the government bring a substantial number of enforcement actions pursuant to citizen suit provisions. These citizen suits are facilitated by publicly available discharge information that makes it easy for a citizen to prove the violation. To some extent, the entire process of environmental implementation and compliance is kept honest by self-appointed watchdogs in the form of the press and the non-governmental organization (NGO) community.

A similar, although not identical, dynamic can be found in some other countries. India, for example, has an independent supreme court that has on

occasion forced government agencies and individuals to implement environmental laws and policies. The court makes itself a forum for "public interest litigation," and has explicitly indicated that it will entertain petitions from social advocates. Moreover, the court functions in the context of a free press and independent NGO community. The court's own actions, as well as information about pollution and health impacts, are routinely reported to the public. This creates a circular dynamic similar to the United States in which public pressure is both informed and created by information disseminated by the press and NGOs, and information about the decisions of environmental bodies leads to further input and pressure from the public. However, environmental enforcement is a dismal failure; in India's lower courts, cases routinely take as long as fifteen years to come to resolution.

The second category consists of a large number of countries with written constitutions and sometimes extensive systems of laws, but where it can fairly be said that the laws are mere formalities. There is a body of legal scholarship that examines how laws on the books in such countries correspond (or do not) to the law in practice, "the way life is actually governed."[8] The countries of the former Soviet bloc fell into this category before 1989, and some still do. The former Union of Soviet Socialist Republics' (U.S.S.R.) constitution enumerated certain rights of the public. However, these constitutional provisions were not self-executing, and often the authorities failed to enact laws that would implement these basic rights, or wrote laws that effectively subverted the higher requirements.[9]

More fundamentally, even where laws were enacted (whether to carry out constitutional rights or for other purposes), they were not applied in a predictable, even-handed way, and often were disregarded in favor of the imperatives of the powerful leadership. In this sense, the U.S.S.R. was classically a government of men, not laws (the cliché of the United States is that it is a government of laws, not men).

Environmental laws in the Soviet bloc could be (and routinely were) overridden by official but informal decisions, for example, decisions in favor of production. These decisions were generally decisions made in the back room rather than with transparency. Thus, a government official or a plant manager in a state-owned enterprise could decide to override an environmental requirement in favor of the higher priority of meeting a production goal.

In any case, even had there been the desire to prosecute violations of the law, it was difficult to do this. The violator was almost always a state enterprise of

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8. *See, e.g.*, Maimon Schwarzchild, *Variations on an Enigma: Law in Practice and Law on the Books in the USSR*, 99 HARV. L. REV. 685, 686 (1986) (reviewing OLYMPIAD S. IOFFE & PETER B. MAGGS, SOVIET LAW IN THEORY AND PRACTICE (1983)).

9. For example, the Soviet Constitution granted "freedom of speech, press, assembly and freedom to hold mass meetings and public demonstrations, but with the qualification—effectively rendering them meaningless—that these rights are to be exercised 'in accordance with the people's interests . . . and with a view to strengthening the socialist system.'" *See id.* at 689 (quoting U.S.S.R. CONST. of 1977, art.39).

one form or another (i.e., subservient to another arm of the government structure). Everyone—enterprise and environmental enforcer—answered to the same higher power, which meant that each lacked the independence it needed to do its job, except as authorized by that higher power. Pervasive state ownership meant that economic decisions were subverted to political goals and power relationships, in particular the Party's interest in maintaining full employment and its insistence on politically-set production goals.[10] In this situation, the environment did not stand a chance. To a large extent, these conditions continue to be the norm in China, despite a great many "official" pronouncements on the importance of a clean environment.

In sum, the situation was characterized by basic discrepancies between the laws on the books and actual practice dictated by the individuals in power. Longstanding habits are difficult to break: since the dissolution of the U.S.S.R., the law-making process has become more prominent, and laws have increased in significance. But as many have noted (including Söderholm, discussed in more detail below), personal relationships and extralegal ways of resolving issues have continued to be stronger than law. And law often seems to be a selectively applied vehicle to carry out the objectives of the leadership.[11]

The third group of countries historically have not conducted their political or commercial business on the basis of laws, and have only recently begun the process of moving toward the creation of a law-based society. Some of these countries have begun writing laws in recent years. Often, however, the motivation for law creation has been in order to adapt to international norms with the hope of attracting outside investment or to join the world trade organization. The impetus is externally rather than internally driven, which means that law creation may take place without a deeper understanding or commitment to the entire culture of laws as a social compact.

China is the largest and most interesting example of this category. Historically, China has been governed on the basis of personal relationships. The recent introduction of written laws is beginning to force people to learn very new ways of managing their lives and relationships. This is a steep learning curve that requires considerable time, even in the best of circumstances. But, this is happening in the context of a society in which, despite the introduction of laws, power is centralized in the Party. So long as real decisions are made on the basis of power and authority rather than law, the mere fact that laws exist probably will not carry much weight when actual decisions are made contrary to what the law demands. Not surprisingly, there are few truly independent NGOs that might act as the guardians of law or as legal watchdogs of government failures in China.

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10. It may not always be the case that state ownership is an impediment to environmental improvement, as it seemed to be in the Soviet bloc. I recently heard a Taiwanese expert argue that state ownership made it easier to make environmental improvements.

11. Russian tycoon Mikhail B. Khodorkovsky pointedly said that the prosecutor and judges in his case would base their decisions on instructions from the Kremlin and the prosecutor general, a view confirmed "even by some political analysts with ties" to Vladimir Putin. Steven Lee Myers, *10-Month Trial of Oil Tycoon in Moscow Draws Close*, N.Y. TIMES, Apr. 12, 2005, at A8.

Moreover, unlike, for example, the United States, there is no clear and reliable judicial remedy in China should the government fail to implement or enforce laws. The judiciary is not independent. Judges are appointed by, and answer to, the local people's congress, which is often the same body that controls provincial industry and pays the salaries and social benefits of the local Environmental Protection Bureaus (EPBs). They are said to receive yearly political training, which further undercuts their independence and the likelihood that they will make a decision that is contrary to official doctrine. Despite the existence of "green" newspapers and television outlets in almost every large city, the press is neither free nor independent. In fact, the press is cautious about what issues it will discuss in print and how it goes about such a discussion and adheres to official doctrine.[12]

At an even more fundamental, cultural level, Chinese environmental authorities (such as their EPA, the State Environmental Protection Administration (SEPA), and the local EPBs) are subject to many conflicting goals and purposes. Officially, a clean environment is a stated national goal. At the most practical level, the government knows that its heavy load of pollution could stir up dangerous social unrest. But EPBs also know that their very hierarchical society strongly favors full employment and that it continues to use soft budgets to keep afloat non-productive and polluting industries. Further, the EPBs know that the "owners" of these industries are the same people who pay their salaries. In the complexity of their society, the EPBs are always alert to the unspoken rules that guide their day-to-day actions.

Moreover, although the EPBs know about the laws, they do not have experience working with laws. In any case, the large number of environmental laws China has enacted in recent years tend to be extremely broad "framework" laws, many of which still require sub-laws before they can be implemented. Thus, the mere existence of laws says little about the force and effect of those laws on how people and enterprises interact on a daily basis, including how they manage pollution.

Within the constraints of the society, it is possible for some people to take limited independent action on the environment. One example is a Chinese lawyer who brings suit seeking damages for the victims of pollution. However, he is careful not to challenge the government directly or to complain about its failure to implement the law. Nor, for obvious reasons, can the press be very aggressive in watch-dogging government performance.

Comparing all of these quite varied experiences, one way to think about this is to ask whether law in a particular society is an end point or is an ongoing process. Thus far, in the third group of countries, of which China is an example, the goal has been to get laws in place, while implementation is on a farther horizon. In contrast, in a genuinely law-based country, the mere fact of a law's

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12. There are now examples in China of press that is beginning to assert its independence, particularly following the SARs debacle, and also there are examples of crackdowns on adventurous editors. *See, e.g.*, Howard W. French, *China Tries Again to Curb Independent Press in South*, N.Y. TIMES, Apr. 15, 2004, at A14.

passage is only a single point on a larger dynamic in which various stakeholders compete in the creation of the law and in its implementation. These stakeholders act within the framework of institutions designed to assure that the laws themselves are policed, but in none of the three types of countries is the mere passage of a law sufficient to protect the environment.

B. How Much Influence Do Conventions, Attitudes and Norms Play, in Comparison to Formal Institutional Frameworks (Such as Laws on the Books)

Laws on the books may not only be at odds with practice; they may sharply diverge. A variation on the question examined above is the degree to which well-intentioned laws are essentially subverted by deeply-rooted attitudes, existing conventions, countervailing policies, and societal norms. When this is the case, examining and understanding the conventions is as important, if not more, than knowing what are the terms of the law.

An example could be drawn from the odd history of market-like instruments for pollution control early in or even before the transition throughout the former Soviet Bloc. These legal requirements imposed fees and fines on certain emissions and exceedances of regulatory standards. Observers from a neo-classic economics perspective might assume that the charges would discourage violations of environmental requirements. After all, they cut into profits and it is the goal of every manager to maximize profits.

But every Hungarian, Czech, or Russian enterprise manager knew that the charge was an ordinary operating cost for which the enterprise could request compensation through the device of soft budgets.[13] State enterprises simply were not run on a profit and loss basis—they were run to meet production goals. In fact, even had they wanted to understand the impact of the charges, the enterprises had no familiarity with western style accounting procedures that would have allowed them these kinds of insights. As a result, the fines had no sting (they did not cut into profits because profits were a paper exercise), and managers lacked the tools to understand the impact of charges or fines. Thus, the requirement was a requirement only on paper.

This dynamic would have been impossible to understand from a simple paper examination of the rules. But, what about the fines and charges today when it is said that the economy and enterprises have been privatized? First of all, fines have not been designed to make a real dent on industry's behavior. They are either too small, too inconsistently collected, or they are inconsistent with the barter economy that much of Russia has become. But, even more fundamentally, do we assume that privatization means that firms work in the kind of market environment with which we are familiar and under the conditions of neo-classic market analysis? In fact, the answer may differ country by country. In some countries, this is not a correct assumption. What is a market in Russia is not necessarily the same as a market in the United States or Western Europe.

Söderholm documents that "most elements of the centrally planned economy

13. Söderholm, *supra* note 3, at 368.

continue to exist."[14] Privatization has taken place in a way such that

> [T]he majority of shares essentially belong to the same ministries, committees, and managers [that previously controlled the enterprises and which are] "linked to each other through networks of personal contracts and mutual services, as well as by a system of natural commodity exchanges between their enterprises". . . . Thus, this informal structure (a heritage from the Communist system) has been hard to change only with formal laws, especially as most plant managers have few incentives to begin to run their plants on pure profit-based criteria. . . . [L]arge enterprises, whose outputs are essential inputs to other sectors of the economy . . . can easily rely on their past connections and make claims on public funds. Soft budget constraints, fixed prices, centrally granted investments, tax offsets, and so forth still exist in important sectors of the national economy, and accordingly evidence of real changes in enterprise behavior is hard to find.[15]

What Söderholm says about Russia could be said as well about China's systems of fees and fines. In practice, the principal impact of the system of fees and charges is to fund the activities of the EPBs, rather than change industry's behavior by reducing the profits of enterprises that violate the law. Chen Fu and his co-authors point out that because the fees are "too low," "many enterprises would rather pay emission fees than remedy their pollution problems."[16] Even if the fees were higher, they would be compromised by the almost certainty that the conditions outlined by Söderholm—continuing soft budgets, centrally granted investments, and tax offsets—still exist on a widespread basis in China. Much of industry continues to be owned and controlled in whole or in part by government at some level.

Further, environmental regulators work in a culture that denies them the independence to bring enforcement actions against powerful enterprises. At the first level is the informal process described in this Article, in which

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14. *Id.* at 376.

15. *Id.* at 376-77 (internal citations omitted).

16. Chen Fu et al., *The Control Strategy of SO_2 in China*, *in* SO_2 EMISSIONS TRADING PROGRAM: U.S. EXPERIENCE AND CHINA'S PERSPECTIVE 5, 14 (Wang Jinnan et al. eds., 2000) [hereinafter SO_2 EMISSIONS TRADING PROGRAM. Under China's Air Pollution Prevention and Control Law (The Air Pollution Prevention and Control Law (Daqi wuran fangzhi fa), Article 48, Chapter 6, (1987 amended 1995, 2000)), the practice that enterprises could pollute in excess of national standards provided they paid fees may change. If emissions exceed the discharge standard, they must be reduced within a specified deadline, and at the same time, the polluter must pay a fine (between 10,000 and 100,000 China Yuan Renminbi (RMB)) to the provincial/local EPBs. *See* Richard J. Ferris Jr. & Hongjun Zhang, Key Aspects of the 2000 Amendments to the Air Pollution Prevention and Control Law of the People's Republic of China, Briefing for Corporate Counsel and EHS Managers (2001) (on file with author). Implementing sub-laws or regulations may still be pending, but readers are cautioned to consider this law in the context of the discussion about the impact of laws in Chinese society.

environmental requirements that collide with other government goals, such as production targets or full employment, are sacrificed.[17] China labors continually under this tension.

At the next level, there are no serious tools for environmental enforcement. Fees and fines are simply not designed or used to assure compliance.[18] The system is designed principally to assess funds to finance environmental bodies like the EPBs. As a secondary function, EPBs respond to complaints about particularly vexing or egregious environmental threats,[19] which they are authorized to shut down in extreme cases, much as pilots on transatlantic flights asked smokers to refrain from smoking for twenty or thirty minutes when the cabin was particularly full of blue smoke.

As a result, the steady, reliable message to enterprises is the contrary of what it should be to get environmental results: that laws and requirements are infinitely flexible and will bend to conventions, attitudes, and other prevailing norms, in particular the goals of the party in power.

This has particular implications for the possibility of introducing emissions trading. So long as enterprises receive the message that compliance obligations are malleable and subject to change, particularly through negotiation, the main incentive for trading, the opportunity for cost savings against real expenditures toward compliance, is diminished. A different message is essential to make enterprises take seriously an emissions trading program or any other regulatory program.

Finally, environmental remedies must match the prevailing culture. One example of this is deposit-refund regimes on bottles and cans. From a western perspective, recycling is very virtuous. Most people in the United States have only experienced a throw-away society. However, deposit-refund systems do not have the same history worldwide. In some countries they are an unhappy reminder of a world of poverty in which mandatory reuse was a response to deprivation.[20] The feel-good culture that supports recycling in the United States

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17. In fact, Chinese enforcers have only a limited number of relatively ineffective tools to go after polluters who violate the rules.

18. This was confirmed to the author in the course of personal interviews in March 2001 with enforcement personnel in Taiyuan, Shanxi Province during an Asian Development Bank-funded project conducted by staff from Resources for the Future.

19. The "so-called letters and visits (xinfang) method" of citizen notification of officials of problems such as construction noise, dust, etc. is active in Taiyuan. *See* William P. Alford & Yuanyuan Shen, *The Limits of the Law in Assessing China's Environmental Dilemma*, *in* ENERGIZING CHINA: RECONCILING ENVIRONMENTAL PROTECTION AND ECONOMIC GROWTH 405, 420 (Michael B. McElroy et al. eds., 1998). The process in response to complaints is to send EPB employees out to take measurements using, for example, mobile monitoring gear, binoculars, and noise readers. The remedies are to: (1) ask for corrections; (2) close facilities; or (3) impose fines. Two levels of appeal are available to enterprises or others who dispute these findings or the remedy. The hierarchy of appeals includes administrative appeals, appeals to the city EPB, the province, and then to a court.

20. Ideas such as these may go over better with younger Central Europeans who do not

may not be present in, for example, the Ukraine. In a few other countries, I have even heard the argument that littering should be encouraged in order to give underemployed people something to do.

Conventions and norms are found in every society, and are ignored at the peril of the regulator. They range from broad social patterns of behavior to political culture. Andersen's examination of the actual functioning of European systems to use market incentives to control water pollution makes this point strongly with respect to political and legal culture:

> [T]he choice and implementation of specific policy instruments depends to a considerable degree on the national context, or what we have more accurately described as the national policy style. Strategies for pollution control reflect deeply-rooted traditions of government intervention, and in particular, of the relationship between government and industry. . . . Each nation's regulatory style is thus a function of its unique political heritage. It requires comprehensive knowledge of constitutional, administrative, historical and cultural institutions to understand the opportunities and limitations arising from a particular policy style.[21]

C. What Is the Track Record for Rights to Resources and How Well Enforced Are Contracts? Is the Society Characterized by a Break Between Formal Property Rights and de facto Property Rights? How Are These Matters Resolved?

A corollary to the discussion above, about the use of law to guide relationships in society, is the issue of whether property rights are reliable and stable. Property rights, a clear, identifiable ownership stake in your home, firm, or enterprise, are said to bring a sense of responsibility to the management of that property or enterprise. If it is clearly and defensibly yours, you are more likely to take care of it. Larry Summers, President of Harvard University, likes to say that no one ever washed a rental car.[22]

An example of how slippery the concept of property can be in a very different culture is found in practices in the former Soviet bloc in the period between the end of World War II and the decline of Soviet influence. People who thought they owned specific residential properties found that the authorities

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remember the reality of state socialism. *Cf.* SLAVENKA DRAKULIĆ, HOW WE SURVIVED COMMUNISM AND EVEN LAUGHED (1991).

21. ANDERSEN, *supra* note 7, at 21 (citations omitted). He takes the economics profession to task for treating "the issue through micro-economic partial equilibrium analysis that disregards the complexities" and is concerned that "to apply economic instruments thoughtlessly may quickly discredit this policy instrument." *Id.* at 6, 23.

22. Lawrence H. Summers, President, Harvard University, Governance and Global Markets, Address Before 50th Anniversary Symposium and Gala Dinner (Oct. 15, 2002), *at* http://www.rff.org/rff/Events/50th-Anniversary/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=5464.

were moving people into those properties when housing was scarce The "owner" had no recourse but to accept these tenants, who basically by their presence assumed a form of ownership status. In order to reclaim property rights, a Polish friend of mine eventually bought out the "owners" living in parts of his family home by purchasing them apartments elsewhere in the city. In exchange, they moved out and renounced any claim to parts of his home. As far as I know, no courts were ever involved in any part of these transactions, nor was recourse through the courts a realistic proposition. Informal processes moved people in, and eventually out again, challenging the very definition of property rights as we understand them. This was not a unique or unusual experience.

Respect for commercial intellectual property is another example of different notions of property rights. These rights are not well-respected in much of the developing world, in the former Soviet countries, and in China. Although the reason may vary from country to country, this is often attributed to a lingering cultural legacy: where concepts of private property were poorly developed or even were contrary to the prevailing culture, and recourse against appropriation was in any case weak, at best, people got into bad habits that linger to this day. In some extreme situations, stealing something and getting away with it was perceived as part of a larger goal of fighting authority. Another reason for this persistent, widespread, and routine theft may be the lack of effective judicial remedies in the form of independent courts, adequate laws, and other means to resolve issues through legal mechanisms. As a result, infringers cost businesses and governments billions each year.[23]

What does this have to do with environmental regulation? In a society saturated with state enterprises, it is likely that regulation is not a relatively neutral process in which each entity has responsibility to meet legal requirements imposed on its pollution. Instead, it becomes a more fraternal or political relationship. State enterprises are part of the state apparatus, and they exercise considerable political influence over the enforcement of environmental laws.[24] Of course, in a capitalist economy, private firms also exert a powerful influence, but scholars have noted the "order of magnitude" differences in socialist societies:

> [G]overnment officials and enterprises managers in the socialist system had "an identify of interests"; both suffered when funds were diverted from "productive" activities to "unproductive" environmental protection efforts . . . . In capitalist economies, by contrast, the interests of firms and government are diverse. And this diversity serves to dilute the influence of industry on such issues and environmental law and

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23. Concern about this has led to the creation of organizations such as the Coalition for Intellectual Property Rights dedicated to advancing intellectual property rights protection, enforcement and reform in the countries of the former Soviet Union using public education, legislative action, and legal reform to establish transparent intellectual property rights regimes that adhere to international standards.

24. DANIEL H. COLE, INSTITUTING ENVIRONMENTAL PROTECTION 148 (1998).

enforcement.[25]

The same slippery concept of property that blurs rights in residential properties is also found in the identity of interests between the state and the enterprise. Who actually owns what is not clear. "State ownership" is a kind of shield for the power of human beings who benefit but do not own. The inherent confusion undermines the discipline that property rights might bring into the picture and of the power penalties might impose on enterprises that violate requirements.

Issues of ownership and a basic understanding of the concept of both ownership and contract rights are of particular importance for certain MBIs, such as emissions trading. These are, in effect, the sale of highly intangible commodities. If a society retains considerable confusion and/or ambiguity about the ownership of tangibles such as enterprises, how much more difficult is it to sort out the rights and responsibilities connected with the future rights to emissions from a plant? How do you assure the integrity of the transactions in a country that does not have well-developed contract law principles and enforcement to begin with? And how much more difficult are the problems of assuring that real transactions are taking place when the commodity in question is air? The sale of air raises issues of ownership, verification, and the right to make the sale.

Assuring integrity is quite difficult, even in a society with functioning independent courts and regulatory bodies. The United States was rocked in 2002 by sham energy trades to pump up trading revenue and volume in California reported by Reliant Resources, Dynergy, Enron, and CMS Energy; the out-and-out balance sheet fraud committed by WorldCom; and revelations about seemingly reputable bankers who intentionally structured transactions to allow Enron to hide $125 million in debt. The courts are only beginning to work through these issues, and some of those who were injured may never be compensated for their damage. When the trade is in support of environmental control, it is even more difficult to compensate the loser after one party cheats because the nature of the damage (unchecked emissions to air or water) is not easily captured in conventional remedies like monetary damages or jail time.

There have been warning bells even in the United States about weaknesses, specifically in the programs that use MBIs to achieve environmental controls that highlight the importance of reliable, sustained enforcement. The U.S. Justice Department discovered that PSEG Fossil LLC, the biggest player in New Jersey's emissions trading system, apparently had not installed necessary pollution

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25. *Id*. at 148 (quoting MARSHALL GOLDMAN, THE SPOILS OF PROGRESS 188 (1972)). "One question that arises when the states owns regulated enterprises is who regulates the regulator. . . . If the state possesses the political will to regulate for environmental protection, it certainly has enough power to enforce it. And according to Cohen-Tanugi's theory the state is much more likely to have the political will to enforce compliance with environmental regulations against firms it does not own . . . . On the contrary, state ownership has created inducements to shield enterprises from public scrutiny and accountability." *Id.*

controls or obtained proper permits. An enforcement action brought in 2002 was resolved in the form of a consent decree. PSEG, without admitting any wrongdoing, agreed to stop selling its credits to other firms and to stay out of the trading system. The withdrawal of one of the largest suppliers of emissions credits in New Jersey brought that state's system to collapse.

In the same year, the South Coast Air Quality Management District (SCAQMD) in California and the regional office of the U.S. EPA looked into charges that a Pasadena broker cheated several firms who paid for emissions credits that were never delivered. The SCAQMD manages emissions trading for the Los Angeles region.[26] A third example from the United Kingdom involved a government-sponsored auction in which participating companies bid by offering greenhouse gas reductions. An independent review by Environmental Data Services noted that there were strong grounds to suspect that at least half of the claimed emissions reductions were not real, and blamed the inaccuracies on shortcomings in the Department of Environment, Food, and Rural Affairs regulatory controls and "poorly thought-through rules."[27]

Each of these incidents was relatively small and caught in time. But if cheating of this type can happen within the context of a well-developed legal and oversight system and with a free press, what are the implications for countries with far less developed concepts of property rights or legal institutions to protect markets against fraud and corruption, and little opportunity for public oversight? The commodity in emissions trading systems is pollution reductions, a daunting logistical challenge of monitoring, reporting, and verification against fraudulent record-keeping or phony reductions. Verification can be expensive and notoriously difficult and rests on domestic systems of environmental enforcement. The entire system collapses without a viable legal system or another institution to ensure the integrity of trades and to act in a timely manner to protect wronged parties.

D. Are There Other Influences or Impacts of a Lax Legal Culture?

A robust legal system provides a means for managing failure, whether it is the failure of plants to control their discharges according to their legal requirements or a breakdown related to more intricate arrangements like emissions trading. The very existence of a reliable legal culture gives participants in the process (as well as the beneficiaries of the regulatory scheme) the confidence to engage in the regulatory scheme because it offers an impartial, effective means to sort out differences and thereby instills a sense of fairness. It also imparts a sense of confidence to the general public, who likely are not involved in particular regulatory decisions, but want to believe that the system is fair. Everyone must believe that everyone else within the system will play by the same rules. Otherwise, the system of regulation erodes. Without this, people

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26. *SoCal Air Bosses Probe Broker Deals*, ELECTRICITY DAILY, Aug. 5, 2002.

27. *Free Riders Found in U.K. Greenhouse Trading Plan*, ELECTRICITY DAILY, Apr. 12, 2002.

must find alternative ways of sorting out liability, or decide to opt out and decide for themselves which rules they will follow and which they will not.

These should be considerations for any environmental regulatory program, but they may be acute for emissions trading. An emissions trading system in some ways sets up a series of exceptionally risky transactions in which people exchange an exceedingly complex and intangible property right. They are selling rights to "air," and not only that, often rights that extend into the future.[28] The risk is substantial that a party to the transaction could default (e.g., by failing to provide the emissions reductions that was purchased), go into bankruptcy, or fall victim to the temptation of false accounting, as did the U.S. firms Enron and WorldCom in a different context. When real money is at stake, some authority, administrative body, or court must be available to police extremely sophisticated trades and ensure their integrity.

Legal failure can happen any number of ways. The legal system may not be independent, so that when the dispute involves the government (as inevitably it will when enterprises are state-owned), there is little possibility of receiving a fair and independent adjudication. Judges may lack sufficient experience to handle complex legal matters, particularly those that involve environmental science or policy. Courts may be so lacking in resources that they cannot bring cases to conclusion in a reasonable period of time. For example, Indian trial courts can take as long as fifteen years to resolve a simple environmental enforcement case.

Some of these problems can be fixed in time. Some of the former Soviet countries in transition began after 1989 to restore their pre-war European-style legal systems. The post-1989 world gave them the opportunity to restore their independence and freed them of "political and economic 'safety valves,' the legal means of last resort by which Party/state authorities could avoid their own rules."[29] But these kinds of changes take time. As noted above, some countries have never had a rule-of-law tradition to revive or fall back on. In those cases, the problems will take even more time to fix.

E. Process of Law Enactment

The very process of enacting a law can provide some clues about the predominant culture of a specific country, and may say something about the depth of commitment to law. A model of sorts is the adoption of the U.S. SO_2 trading program, which came at the end of a protracted debate about whether to adopt MBIs for this particular application. The very idea of using the market was controversial in some circles, and the provisions proposed as amendments to the Clean Air Act were subject to considerable scrutiny by multiple sessions of Congress throughout the 1980s.

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28. One interesting test of a country's capacity for environmental MBIs could be whether it is running successful financial markets. As difficult as those markets are, money is a familiar and relatively simple concept, compared with emissions permits.

29. COLE, *supra* note 24, at 80.

The result was a very practical approach designed with a number of important conditions and safeguards to satisfy a wide range of stakeholders, including those who started with significant doubts about trading. The law put government firmly in charge of managing system integrity. It requires industry to obtain and use expensive monitoring equipment to assure that genuine reductions are being sold.[30] Every credit (called an "allowance") is assigned a serial number in an elaborate tracking system.[31] All transactions are online and completely transparent. The government has made a commitment to genuine enforcement to assure that a unit's emissions did not exceed the number of allowances it held over a year. As a result, numerous stakeholders with diverging interests agreed with the program.

In contrast, law drafting in some societies has been, or is still, a closely held process. In the U.S.S.R., the laws were drafted by academically trained experts who were familiar with how other countries wrote such laws. This mostly expert process was not informed by any examination of public willingness to comply, or of the likelihood that industry had the economic and/or technical wherewithal to comply with the rules. The resulting laws were not widely disseminated; indeed, one had to have a "need to know" to obtain laws. This seems to emphasize the conclusion of some commentators that the laws were intended as "show laws" rather than working principles to guide the actions of the U.S.S.R.'s citizens and its government. This version of command and control was notably unsuccessful in the former Soviet bloc.

More fundamentally, the process did not seem either to reflect or be rooted in any deep-seated agreement within society about how much pollution is tolerable, what to do about it, what level of risk the society is willing to accept, and how to manage tradeoffs, for example between growth and control. This is important because environmental requirements place demands at all levels of society, whether it is on motor vehicle drivers to maintain their vehicles or purchase more expensive, cleaner fuels, or on plant operators to install and use control technology or develop more efficient production methods. Any solution to the problems of pollution requires widespread mobilization across each society, as well as commitment not to obstruct or actively subvert the rules. In a democracy, assent is gained through the legislative process. In other forms of society, consensus may be developed in other ways.

In countries where the rules are formulated in secret processes (even if the results are publicly available), the next questions must be where is the support for the rule, how the society proposes to carry out the laws, and how it intends to obtain compliance with the many costly and inconvenient tasks that environmental protection imposes on society. Will sub-rosa habits defeat the rules that never had public acceptance to begin with?

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30. 42 U.S.C. § 7651k (2000).

31. *Id.* § 7651b.

III. DOES ADEQUATE INFRASTRUCTURE EXIST TO SUPPORT ROBUST ENVIRONMENTAL REGULATION?

Whatever tool is employed, environmental protection requires infrastructure in the form of an adequate level of knowledgeable personnel and technical training. As an example, U.S. EPA has about 18,000 employees at locations around the country. EPA's resources are augmented by state and local environmental protection bodies, which often have delegated power to carry out regulatory and enforcement tasks. As noted earlier, EPA's enforcement capability is reinforced through provisions that allow citizens to bring enforcement actions in place of the government.[32] Of course, one question is how many personnel are necessary to make the system work effectively?[33]

The fact of life is that most developing world environment ministries are thinly staffed and highly under-resourced. On the plus side, many of these countries have technically trained civil services that come out of excellent universities, societies with high rates of literacy, and a proliferation of environmental laws. But, collective experience independently implementing and enforcing the environmental laws is often limited. Moreover, most countries have few good enforcement tools—often the only enforcement penalties are variations on the fees and fines system discussed above (with the same frailties),[34] criminal penalties, and the right to shut down industry. None of these tools are well-designed to achieve long-term implementation goals.[35]

IV. WHAT IS THE ECONOMIC CONTEXT WITHIN WHICH THE ENVIRONMENTAL PROTECTION REGIME WORKS, AND HOW SUPPORTIVE IS IT OF THE USE OF WESTERN-STYLE MARKET INCENTIVES TO INFLUENCE SOCIAL BEHAVIOR

A. Does Industry Genuinely Work in a Market Environment as Defined in the Western Democracies?

Even in a well-developed market economy, firms may have a number of potentially conflicting objectives. Efficiency might be one, but there can be others. This is at least as true in the developing world and the countries in

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32. *Id.* § 7604.

33. One comparison is the European Union's Environment Directorate-General (DG), which is based largely in Brussels and has around 550 staff. Its main role is to initiate and define new environmental legislation and to ensure that measures which have been agreed upon are actually put into practice in the member states. However, environment ministries in member states, and often more local bodies, have the immediate responsibility for putting European Union (EU) environmental measures into practice.

34. *See supra* Part II.B.

35. For a discussion about how Polish environmental enforcers worked to improve their available enforcement tools, in part, by adapting into their own legal and cultural regime mechanisms used in U.S. enforcement, such as compliance schedules, see Ruth Greenspan Bell & Susan E. Bromm, *Lessons Learned in the Transfer of U.S.-Generated Environmental Compliance Tools: Compliance Schedules for Poland*, 27 ENVTL. L. REP., NEWS & ANALYSIS 10296 (1997).

economic transition, where the driving motivation of firms can be quite different from the mostly profit-driven motivation that we assume in the United States.

Despite this, the literature that encourages policymakers to apply MBIs outside of the western democracies appears to make two (not fully articulated) assumptions. One is that enterprises everywhere are principally motivated to be efficient, and these motivations apply as well to how they rate or assess ways to comply with environmental requirements. The second is that, as a result, firms would be natural allies in support of the most efficient environmental tools.

These assumptions are not fully accurate, even in a fully developed market economy. U.S. experience with environmental regulation seems to indicate that firms are not driven entirely by concerns of efficiency. In fact, there may be a big learning curve for firms on these issues. If they had been so motivated, industry might have pushed hard and consistently for market-driven tools from the earliest days of environmental regulation. Instead, industry came around to these issues in much the same evolutionary way as did other parts of the environmental community, arguably based not on theory, but on actual experience.

The first point of inquiry, then, is to ask what motivates industry to support the use of MBIs for environmental regulation? Is it reasonable to suppose in the United States that industry (or some parts of industry) could really understand the resource-saving virtues of MBIs before they had been forced to grapple with the actual costs of environmental regulation accompanied by genuine enforcement? Or, were they eventually motivated toward goals of greater efficiency by the economic pain of enforced compliance? Was on the ground experience necessary to demonstrate the price tag for meeting environmental requirements, or was economic theory sufficient?

This is important because in many countries of the world, compliance is low or erratic. The dichotomy between laws on the books and actual practices, outlined above, has developed its own set of non-classical market incentives. In some societies, the economy runs on networks of personal contracts and mutual services, natural commodity exchanges, or barter agreements. In these countries, the incentives for managers of firms are not the at-best "aspirational" laws,[36] but the reality, for example, of production or full employment goals, or some other goal consistent with that society's overall objectives. Under these circumstances, how does one define "incentives" and how does industry assess its best interests? How does a regulator build a culture that sees advantages in cost-saving approaches to environmental requirements?[37]

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36. "Aspirational" is the characterization applied to laws that contain idealistic ambitions and ideology rather than guides to day-to-day behavior.

37. To date, the functioning emissions trading programs in the United States are for air, not water, although the Bush Administration has announced a program for water quality trading. Some analysts, James Boyd at Resources for the Future among them, have expressed doubts about whether the challenges of water basin-based effluent trading—among them highly disparate sources (including non-point), hydrology, and the difficulties of monitoring—can be overcome. JAMES BOYD, THE NEW FACE OF THE CLEAN WATER ACT: A CRITICAL REVIEW OF THE EPA'S PROPOSED

B. What Information Does Industry or Government Have About Firms' Costs? What Is the Status of Financial Accounting?

The advocates for relying on market incentives appear to assume that industry knows the costs of environmental protection, the first step to making good decisions about compliance. In fact, it is not correct to assume that businesses in all parts of the world use the same analytic tools, particularly cost accounting.

It is true that industry in the western economies is able to understand and analyze its economic pain because it is the beneficiary of a century of experience with cost accounting.[38] But, these assumptions may not be true in some developing countries, which may lack not only elementary understanding of the way markets function, but even more critically, basic tools that can allow them to find out their costs. Price incentives face significant barriers in an economy without the ancillary institutions essential to allow markets to set and enforce prices.

One example has already been mentioned: western style cost accounting was unknown in the U.S.S.R. and is still rare in the new Russia. Industrial ministries, and the bureaucrats who ran them, were responsible for deciding how much of any particular commodity would be produced. Soviet accounting was built on the ideology of central planning that decided all production and distribution. Accounting in that context reflected the influence of a particular philosophy on economic planning, market activity, and enterprise recordkeeping and financial reporting. The way this was managed took various twists and turns, but the basic rule was that detailed annual production targets were formulated through five-year plans by the Party's leadership. Accounting ensured the proper degree of supervision and control in all branches of the economy to assure adherence to the goals.[39] During Nikita Khrushchev's economic reforms, the concept of "profit" was introduced into the socialist economy, but as a planned category, calculated as a fixed percentage of cost, rather than what is left over when you subtract expenses from income. Clearly, things have changed, but the question is: how much and how fast?

In other words, the basic tools of economic calculation can differ from society to society. One should not assume that what a firm manager learns from western-style accounting in the western democracies is the same as what another

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TMDL RULES 30-32 (Resources for the Future, Discussion Paper No. 00-12, 2000), *available at* http://www.rff.org/Documents/RFF-DP-00-12.pdf.

38. *See* Söderholm, *supra* note 3, at 366.

39. Because the careers and bonuses of enterprise directors depended on meeting production targets, there was great pressure to exceed the targets prescribed by annual plans, such that directors commonly resorted to such questionable practices as arranging for low production targets by underestimating plant capacity, hoarding supplies and fulfilling output targets by neglecting quality control. The Soviet economic authorities used their own system of cost-accounting to discourage such shortcuts.

manager might learn on the basis of accounting norms in his own system. What western market societies see as tools for documenting commercial transactions, other societies may regard as rules related to pursuing a particular ideology of production. Issues such as these pose basic barriers to the transfer of tools that assume these basic building blocks.

The discussion above focuses on how firms calculate profit and loss. A separate form of unique accounting skills are needed to keep track of the extremely intangible good—air—that is being sold in transactions like emissions trading. Even if the basic financial accounting tools were adequate, other kinds of complex and sophisticated monitoring and accounting would be necessary to account for this form of trading. This is discussed below.

C. Do Authorities Accept the View That Prices or Taxes Can Be a Tool Toward Economic Efficiency?

This section asks about the familiarity and comfort-level of authorities to consider prices and taxes as tools for achieving environmental results, and whether they, in fact, have sufficient experience to consider these options.

Looking again to U.S. experience, the use of trading, prices, and taxes to achieve pollution control either was not immediately obvious to environmental policymakers, or they deliberately decided, for the most part, not to use them for environmental regulation in the early days of the U.S. regulatory system. Congress could have legislated the use of charges or taxes. It did not, despite the existence of a functioning tax code and a full-throttle market economy.[40] MBIs in general were not the immediately obvious first tool of choice. Even in a well-established market economy, none of the early environmental laws used economic tools.

MBIs eventually came to be adopted into the environmental tool kit as a practical EPA response to some vexing Clean Air Act implementation problems. EPA used available legal authority to set up a system that gave industry the opportunity to bank or sell emission reduction credits in the context of air regulation; this created a price for emissions. As detailed earlier, the success of this early experiment led to the enactment in the 1990 U.S. Clean Air Act of the now well-known SO_2-reduction credit banking and trading program to attack acid rain.[41] Its purpose was to soften the economic impacts of a firm regulatory program by letting firms that can control their pollution more cheaply accumulate and sell credits to firms who must otherwise spend more to reduce pollution. But it is clear from the history of the enactment of these provisions that, when they were introduced, lawmakers considered a great deal more than pure economic policy or engineering.

This is put into stark reality by another example from the United States that

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40. EPA could not have done this by itself, as the agency lacked legal authority under the Constitution to unilaterally impose taxes or any charges that went beyond recouping the costs it incurred in, for example, issuing permits.

41. 42 U.S.C. § 7651 (2000).

shows the cultural and political limitations of employing taxes and prices for environmental purposes. In the United States, it is almost impossible, politically, to use taxation to increase the price of gasoline, thereby, trying to discourage excessive driving. There is much discussion of the car culture of the United States; whatever the reason, people are very resistant to perceived limitations on their right to drive cars. Only a very brave legislator will propose a gas tax, although it is likely the most direct way to reduce car mileage. High gas taxes are a fact of life in Europe, where, apparently, taxes are not as frightening.[42]

Another question to ask is whether the charge or tax is designed to change behavior by making it expensive, or whether it serves some other purpose? As discussed elsewhere in this Article, some countries have institutionalized environmental charges and taxes, but not necessarily for the purpose of bringing about efficiency or, indeed, even because they made the connection between the two.[43]

Finally, systems of taxation do not work automatically. Environmental taxes or levies are even harder to collect than sales and income taxes, which are already quite difficult in much of the developing world for a myriad of reasons, including the difficulty of monitoring sales or wages and corruption. Taxes on pollution are highly dependent on good environmental monitoring. Pollution discharges generally must be measured by special equipment as they occur. This requires monitoring capability that either does not exist or is extremely expensive in much of the developing world.[44]

And even more fundamentally, the very possibility of taxation rests on political will. It assumes that countries are willing to impose and actually collect charges significant enough to force industry to adopt and install new technology. Further, it assumes that governments can turn around a history of actions designed to insulate firms from market pressures by the equivalent of soft budget constraints, or to protect well-connected firms through loans made on the basis of connections and favoritism, toward decisions based on sound business principles and sober assessment of credit. Using the market to spur technological change is only plausible if one can rule out the many ways in which market forces are undermined.[45]

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42. There are signs this attitude is changing in an increasingly automobile-dependent Europe.

43. *See supra* Part II.B.

44. There are alternatives to monitoring, but these require judgments, which can easily fall prey to corruption and favoritism.

45. The *Financial Times*, *New York Times*, and other newspapers have reported repeatedly on lax banking practices in China. *See, e.g.*, Elisabeth Rosenthal, *Bank of China's Mounting Problems*, N.Y. TIMES, Feb. 1, 2002, at W1. China's most prominent state bank, the Bank of China, was hit first by a report from China's National Audit Office, which found that $320 million of bank funds had been diverted from several branches of the bank through "unlawful loans, off-the-books business and the unlawful granting of letters of credit and issuing bank bills," and then by a lawsuit between the bank and former clients in New York. *Id.* "American bank regulators said an investigation begun in 1999 had turned up the same kinds of irregularities at Bank of China's United States operations" during the 1990s. *Id.* Eventually this led to the dismissal of one of

D. Will Society and the Relevant Stakeholders Tolerate the Use of Market Approaches?

Market based instruments may not "work" in a particular society because they do not fit the prevailing culture for a wide variety of reasons. One example of this in a democracy is when important stakeholders (who might otherwise be comfortable with markets for other purposes) will not accept this kind of approach to environmental regulation. It might also be because of the history and experience of the society in general, as well as its government and industrial sectors.

In the United States, resistance to MBIs is found in both likely and unpredictable quarters—sometimes from NGOs and, in some cases, from industry. People may oppose economic instruments because they fear that emissions trading cannot be adequately enforced or because they mistakenly think these programs sanction pollution.

Surprisingly, industry is sometimes resistant, for example, if a change in regulatory approach might require an expensive or cumbersome change in its internal systems or challenge the existing firm bureaucracy. "Firms may simply support the continuation of the status quo . . . because replacing familiar policies with new instruments can mean the existing expertise within firms becomes less valued."[46]

Indeed, the success of the SO_2 trading program in the United States has not, thus far, led to wholesale revisions in the U.S. approach to environmental protection. Most regulatory programs continue to use traditional methods—trading is a tool added to a basically conventional approach.[47] In part, this is because it is technically and politically difficult to make changes in a well-established, ongoing regulatory program. For example, if the change requires legislative amendments, there can be opposition from interests who fear that a reexamination of the law may open discussion about additional issues that industry and other stakeholders would like to avoid reopening, or that it might generate political firefights. As Keohane notes, there may be resistance from the internal bureaucracy or management of firms.[48] Sometimes too much technology and human resources economic investment is tied up in the status quo.

The process of law amendment may be another practical barrier to change. Environmental legislation originates in several committees in the U.S. Congress, not one. The various committees may be more interested in guarding their jurisdiction or may be dominated by Congressmen (or staffers) with strong opinions or a desire to protect their legislative territory, so much so that reform

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China's most influential bankers. *Id.*

46. NATHANIEL O. KEOHANE, ET AL., THE POSITIVE POLITICAL ECONOMY OF INSTRUMENT CHOICE IN ENVIRONMENTAL POLICY 30 n.52 (Resources for the Future Discussion Paper No. 97-25, 1997), *available at* http://www.rff.org/Documents/RFF-DP-97-25.pdf.

47. The SO_2 trading system is an MBI built on top of a conventional regulatory approach.

48. *Id.*

efforts may not be realistic, despite practical and policy arguments to the contrary. This is one reason why there is very little consistency among the approaches embedded in the various U.S. environmental statutes and the tools they impose,[49] and one example of the considerable political and bureaucratic vested interests involved in making or changing the rules.[50]

What about attitudes elsewhere in the world? The European Union (EU) has made a commitment to use trading to manage greenhouse gas emissions, but there have been pockets of anti-trading resistance in Europe, and even more in the developing world.[51] For some, emissions trading is a disguised pay-to-pollute scheme in which particular industries or plants are allowed to avoid personal responsibility for the pollution they create.[52] Still others are resistant to the idea of monetizing pollution, which in their view undercuts the moral dimension of environmental controls. If these convictions are held deeply enough to impede the development of a workable environmental policy, it does no good to say they are wrong-headed.

In addition to ideology, tolerance for market solutions for social issues is very much shaped by experience and habits. If industry and significant parts of the economy have little or no real experience with or exposure to markets as we view them in the West, they might agree to markets in principle, but their daily experience tells them something quite different than the model the western economist posits of the rational man.[53]

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49. For example, some environmental regulations require cost/benefit balancing; others forbid it. Some are health-based; others are technology based.

50. Cole & Grossman, *Toward a Total Cost Approach*, *supra* note 7 (exploring whether so-called command and control is in fact inefficient, and examining in detail the slow evolution of U.S. practice and law); Cole & Grossman, *When Is Command-and-Control Efficient?*, *supra* note 7 (same).

51. JOSEPH A. KRUGER & WILLIAM A. PIZER, THE EU EMISSIONS TRADING DIRECTIVE: OPPORTUNITIES AND POTENTIAL PITFALLS 14 (Resources for the Future Discussion Paper No. 04-24, 2004), *available at* http://www.rff.org/Documents/RFF-DP-04-24.pdf.

52. In the context of global carbon trading, the argument is made that affluent countries maintain their expensive lifestyles and use money to make sure that any reforms are conducted only in less affluent nations. *See, e.g.*, Shankar Vedantam, *Kyoto Credits System Aids the Rich, Some Say*, WASH. POST, Mar. 12, 2005, at A12.

53. The dominant neoclassical economic theory holds that individuals, households, and companies rationally serve their best interests and that competition sorts out prices, wages, and the markets for goods and labor in economies' movement toward equilibrium. Some parts of the economics profession are questioning the rational man model. "Behavioral economics"—the study of how people do not make rational choices—is increasingly being applied to securities prices, consumer purchasing, contracts, and labor bargaining. Psychologist Daniel Kahneman of Princeton University shared the 2002 Nobel Prize for work in the area. *See* Peter Monaghan, *Taking on "Rational Man,"* CHRON. HIGHER EDUC., RES. & PUB., Jan 24, 2003, at A12, *available at* http://chronicle.com/free/v49/i20/20a01201.htm.

"Neuroeconomists" are also challenging the neoclassic model. Gerald Zaltman of Harvard University says ninety-five percent of consumer decisionmaking occurs subconsciously and this

In many countries, economic life runs on the basis of connections and claims to public funds. Söderholm emphasizes that, in Russia, soft budget constraints, fixed prices, centrally granted investments, tax offsets, and the like still exist in important sectors of the national economy.[54] These devices continue to exist many years after the fall of state socialism, and are not going away very soon.[55] The economics profession is starting to recognize that even in the western democracies, the assumptions one makes about economic or market motivation must be adjusted for the reality of the culture and its particular traditions and for a wide range of other influences.

All of the issues outlined above cast doubt on one of the main arguments made following the fall of the Soviet Union for why countries could skip traditional methods of environmental regulation and move directly to harnessing market incentives—that the countries in transition, and the countries of the developing world, could "leapfrog" over the mistakes made in the West. The theory is that Country A can look at the history of regulation in Country B and avoid whatever inefficiency and waste Country B incurred in its environmental learning phase. Presumably, if Country A is a poor country, it will be interested in moving directly to solutions that are the most efficient.

The difficulty with this argument is that it ignores social norms and culture and seems to consider environmental protection as a purely technocratic exercise. The main examples of leapfrogging are found in highly technological situations where culture and habits do not matter very much. The most cited example is the proliferation of mobile phones that overcame infrastructure deficiencies that kept people from obtaining telephone landlines.[56] But the analogy to environmental

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school of thought is bolstered by recent experience such as the bursting of the Internet bubble. Eric Roston, *The Why of Buy*, TIME, Mar. 8, 2004, at A20. "Research from fMRIs and other machines bears all this out. . . . Read Montague, a professor at the Baylor College of Medicine, gave subjects the "Pepsi Challenge" in an fMRI scanner." *Id*. He found that his subject's "people reward center" lit up for Pepsi (more pleasing to the palate) but that "Coke's branding hit literally at the core of their sense of self, a much stronger bond" this suggests that "brands are so powerful that we are sometimes more likely to buy something we identify with than something we like better or that is better for us." *Id.* Researchers are also examining the impact of money and rational behavior. The distinction that money should be treated as a "mere exchange mechanism" that allows people to purchase things is lost on our brains. *Id.* "The dopamine release that makes a juicy hamburger so satisfying works the same magic even if we simply find the money to buy the burger." *Id.*

54. Söderholm, *supra* note 3, at 377.

55. *Id.*

56. For an example of how even this issue has cultural and political overtones, see Emily Wax, *Freedom, a Call Away? Control on Cell Phone Use in Eritrea Is Called Tool of Repression*, WASH. POST FOREIGN SERV., Apr. 20, 2004, at A13 (pointing out that the Eritrean government, a country of four million on the Red Sea in the Horn of Africa, has gone to extraordinary lengths to prevent access to information, including denying citizens access to mobile phones). The Eritrean government notice for application for the country's first cell phones indicated that only government ministers, diplomats, and selected humanitarian organizations would be considered. *Id.*

Elsewhere in Africa,

reforms does not hold on examination, and there are no obvious concrete examples of environmental leapfrogging. The argument sounds good in theory, but in fact, because there are so many differences between societies and countries (including legal, traditions, market culture, history, and the like), taking the experience from another country is an extremely tricky business. Even understanding it is a stretch, and applying it is even something else.

V. LEVEL OF ENVIRONMENTAL AWARENESS AND CONTEXTUAL HISTORY OF ENVIRONMENTAL REGULATION

A. How Good Is the Available Emissions Monitoring Data? Who Is Responsible for Monitoring?

Any sort of compliance and enforcement system rests on monitoring—knowing what pollutants and the amounts of those pollutants that are released into the environment by particular plants. This information is particularly important for emissions trading. Although one can argue about the degree of precision that is necessary, it is beyond dispute that regulators and the public must be assured that real, not imaginary, pollution reductions are being traded.

Monitoring can be costly. It requires good equipment, but also a level of integrity. It is as easy to turn off monitoring equipment at inconvenient times as it is to turn off pollution control equipment. It is important to know whether monitoring is the responsibility of the plant or of the government, and who polices the numbers to assure their reliability. As the public often plays a role in data integrity, one might also ask whether the data is made available to the public and how.

It can make a difference whether the monitoring is plant-specific or if it only gauges ambient conditions. For some countries, most available data is ambient, which discloses little about the contribution of specific sources. But, even if the data might include some stack monitoring, it might be difficult to use for any number of reasons. Using China as an example, current pollution policy sets standards for stack gas concentration of SO_2. Pollutant concentrations are based on often-questionable, self-reported data from the enterprises, and on periodic stack testing by the local EPBs. These estimated concentrations are combined with limited data on pollutant flows to calculate mass emissions from the enterprises, and form the basis of the emissions levy. Whether these calculations are adequate for anything more than the limited purpose of the existing levy is an open question.

> cell phones have become not just a standard amenity but an indispensable tool of freedom, democracy and safety in war. In northeastern Congo, residents pooled cash to buy cell phones, which they used to notify relatives when rebels were on the move. In Kenya, . . . [p]olling-place workers in December 2002 elections [aided democracy] armed with mobile phones [by] quickly call[ing] in results to the news media and to election headquarters, making vote-rigging difficult.

Id.

Cole and Grossman have provided a response to those who minimize the importance of monitoring in proposing alternative regulatory schemes:

> [S]tandard economic accounts of the comparative efficiency of alternative regulatory schemes are insensitive to historical, institutional, and technological contexts. Most importantly, they tend to assume "perfect (and, incidentally, costless) monitoring," or they assume that monitoring costs are the same regardless of the control regime that is chosen. . . . [T]here are many other economic, institutional, and technological variables that can affect the comparison of regulatory options, which is precisely why case-by-case examinations are required.[57]

B. Is Enforcement a Disinterested, Independent Function or Is It Highly Influenced by Personal or Informal Relationships, Special Arrangements, and Privileges?

What is industry's experience with enforcement, and what model do plant managers carry in their minds of the likelihood that they will be held responsible for violations of their legal discharge requirements? Is enforcement seen as a consistent and reliable process? Can it be manipulated by well-connected people or is the enforcement process reasonably independent of influence and relationships? What provides environmental discipline to companies? Is it easy to get around enforcement, for example, by bribes?

The answers to these questions can in turn help observers understand the practical incentives that motivate industry. If industry can easily get around the environmental requirements by means of bribes, through personal connections, or by making the case that environmental controls would interfere with production goals or would reduce employment, industry's frame of reference will be very different from what it might be in the context of a rigorous environmental enforcement regime and a culture of compliance. And, the arguments for resource-saving devices, like MBIs, are far less compelling if industry knows it can easily avoid compliance expenditures altogether.

Using China as an example, high officials at SEPA make strong statements about China's compliance intentions,[58] but enforcement is generally agreed to be very weak, undermined by inadequate resources, poor training, personal ties, corruption, and other manifestations of non-environmental criteria "brought to bear in deciding how the breach of a law or regulation ought to be managed."[59]

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57. Cole & Grossman, *When Is Command-and-Control Efficient?*, *supra* note 7, at 935-36, 937-38 (quoting CLIFFORD S. RUSSELL ET AL., ENFORCING POLLUTION CONTROL LAWS 3 (1986)).

58. Bureau of National Affairs quotes Xie Zhenhua, Chief of SEPA, that China will "close down heavy polluting, unprofitable, small, and backward factories," and ban "heavy-polluting fuels" from downtown areas of major cities. *Asia and the Pacific: China*, INT'L ENV'T OUTLOOK, Jan. 29, 2003, at 32.

59. Elizabeth Economy, *Environmental Enforcement in China*, *in* CHINA'S ENVIRONMENT

Enforcement officials in Taiyuan, Shanxi Province, say that they essentially rate enterprises on their compliance.[60] However, an enterprise can consistently "flunk" by getting a low score year after year, without penalty or consequence. Consistent with Economy's findings about general conditions in China,[61] the EPB is grossly understaffed and under the political and economic control of the same city or provincial authorities who also supervise industry. Even if they had the independence to do their job, enforcers do not have many strong tools at their disposal. The tools at their disposal are, as noted, mostly the power to collect fees and fines, and to shut plants down, almost always temporarily,[62] to curb immediate exceedances that communities perceive as threatening.[63] This is hardly the kind of signal that forces enterprises to consider finding cheaper ways to comply with the law.

Whatever tools are used, it is far preferable for companies and enterprises to receive a steady, reliable message that the environmental requirements are serious and that they require continuous efforts on the part of all involved toward meeting the regulatory goals. Those who receive such a consistent message are likely to respond differently from those who get the opposite message and are constantly looking for alternative ways through the system beyond compliance. If it is known that the environmental regulator has only weak tools (or motivation) for catching violators or that adjustments can be made if you know the right people, the probability of getting caught, and being punished, will be understood to be low.

Therefore, an important question is whether enforcers have sufficient independence to enforce the rules without fearing that they might arouse powerful interests and endanger their own wages and social benefits. The lesson is the same for conventional and market-based tools. For both, the message to enterprises must be clear, that compliance is mandatory (that, for example, they must either install control technology or purchase emission allowances). But, the need to be completely clear about compliance responsibilities may be acute for emission trading programs where the principal incentive for trading is the opportunity for cost savings against real expenditures toward compliance. Few businessmen make investment decisions based on theory.

Furthermore, even established trading programs require vigilant enforcement, as was demonstrated by the example of New Jersey's emissions trading program for nitrogen oxides and volatile organic compounds, noted above.

Finally, enforcement is a key ingredient in the compact of trust that

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AND THE CHALLENGE OF SUSTAINABLE DEVELOPMENT 102, 117 (Kristen A. Day ed., 2005).

60. This information comes from personal recollection of interviews I conducted as part of Resources for the Future's Taiyuan project to introduce SO_2 emissions trading in that city.

61. Economy, supra note 59, *at* 117.

62. Highly polluting industry in Beijing is being physically moved to new locations, in anticipation of the Olympics.

63. A more complete set of enforcement tools could include civil and criminal penalties, administrative tools, the use of compliance schedules, and other flexible "carrot and stick" methods to herd the regulated community toward genuine compliance.

underpins effective environmental regulatory regimes. Compliance is not enhanced if people think they can game the system. And, a key ingredient of basic trust is the belief that requirements that impose costs are administered in, at least, a relatively fair manner. This is equally true for emission trading, where all participants and the community at large must know that allowances represent real commitments to reduce emissions. These are transactions that can easily be abused, particularly since air is such an ephemeral commodity.

The possibility of abuse becomes even more clear when you consider that emission trading can result in very different environmental standards for like industries. If the system works, Plant A will pay Plant B to reduce its emissions, instead of doing so itself. The potential bottom line is a series of varied requirements that hopefully refer back to the trading transaction. But what if Plant A is owned by the most influential politician in the country, in a culture accustomed to helping out privileged people? It would be easy to obscure the fact that the grant of discretion to Plant A to pollute less is not based on a legitimate trade, and the outcome benefits the owner of the Plant, not the environment.[64] Nordhaus has pointed this problem out in the context of global CO_2 emissions trading:

> An emissions-trading system creates . . . a scarcity where none previously existed and in essence prints money for those in control of the permits. Such wealth creation is potentially dangerous because the value of the permits can be used for non-environmental purposes by the country's leadership rather than to reduce emissions.[65]

Confidence in emissions trading transactions has been developed in the United States through a high level of transparency. Competitors, NGOs, and public interest groups can monitor trades and know relatively quickly whether industry is meeting its commitments, a sort of "trust but verify" approach. Elsewhere in the world, it is important to insist on similar safeguards, appropriately crafted to fit their particular circumstances.[66] From an enforcement perspective, one must

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64. Although a trading program can be understood as a transaction, it can also be understood as a grant of discretion to some actors to pollute more (or less) depending on whether they are buyers or sellers of allowances. Otherwise, they would all be held to the same standards. The variability in their requirements is what creates opportunities for corruption.

65. Nordhaus, *supra* note 7, at 15-16. People in the countries in transition are unusually aware of this possibility; their experience includes many years of corruption and under-the-table differential treatment. The environmental experts I have worked with in Central Europe want the assurance that a program that essentially grants discretion to certain industries to emit at lesser amounts than others will not be hijacked to serve the purposes of people in power. Janine Wedel has written eloquently about the breakdown in social norms that happened first in the context of the German occupation of Poland and then in the "twilight world of nods and winks" that characterized the period of communism. JANINE WEDEL, COLLISION AND COLLUSION, THE STRANGE CASE OF WESTERN AID TO EASTERN EUROPE 1989-1998 (2001). Wedel covers these issues in greater depth in JANINE WEDEL, THE PRIVATE POLAND: AN ANTHROPOLOGIST'S LOOK AT EVERYDAY LIFE (1986).

66. This does not mean that the exact protections contained in U.S. law must be replicated.

ask if the law offers the opportunity to protect rights and work out disagreements about rights including disagreements between individuals and the government. The basic issue is whether rights can be removed arbitrarily, or whether there is genuine legal protection for rights and a means of resolving disputes about the rights to specific property.

C. Does the Society Set Pollution Reduction Goals That Are Realistically Achievable?

Pollution reduction goals can themselves be a barrier to implementation and compliance. If the requirements are unrealistic or do not allow adequate time for the practical activities involved in implementation, industry is less likely to take them with the seriousness they deserve.

Enforcement is more likely to succeed if sources know they must meet real targets. Compare this with China. Reduction goals are set in extremely ambitious five-year plans. For example, the plan for Taiyuan, Shanxi Province called for 2005 SO_2 emissions to be reduced by about fifty percent below 2000 levels.[67] Five-year planning is a process well-rooted in Chinese government and culture, and there is no reason why five-year planning cannot generate achievable goals that can be met in a cost-effective manner. But, the way the Chinese emission reduction goals are set is divorced from realistic considerations of feasibility. The central planners appear to work in somewhat of a vacuum, and it is not clear what their reference points are for the emission reduction numbers they select. Once formulated, it appears that goals are announced to the EPBs and industry (who otherwise appear to be excluded from the goal setting process) and then allocated to specific industries.

A further demonstration of the somewhat fictional nature of these goals is demonstrated by looking at how goal setting interacts with the time frames for compliance contained in the five-year plans. The specific goals are apparently developed and then re-thought *within* the specified time for compliance, that is, within the five-year period in which they are supposed to be achieved. In other words, a reduction goal of fifty percent which must be met by 2005 is announced in 2000 or later, and then may be subject to adjustment. As a result, industry has no lead-time to adjust to the targets or to plan to undertake its share of the responsibilities. Even if Chinese industry had the experience, resources, and

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For example, in Western Europe, the public is more tolerant when industry and government sit down to negotiate, so Central European trading programs might work without as much transparency as the United States demands. On the other hand, architects of any trading program in Central and Eastern Europe cannot ignore the legacy of the Soviet period, especially in countries struggling with endemic corruption.

67. It appears that the goals stated in previous plans were equally ambitious, for example calling on China to hold total pollutant emissions to the 1985 level by 2000, and bringing them even lower in the designated "key" pollution control areas. In truth, it is difficult to get reliable data, and there is reason to believe that lower officials often provide the data they believe higher officials want to see.

motivation to undertake these ambitious goals, they still would require extraordinary efforts. Pollution reduction requires planning. Equipment must be ordered, paid for and installed, or processes re-engineered. People must be trained to run the equipment and to service it. All of this takes time.

While one could argue that the five-year plan targets are merely to put pressure on industry to act, that argument must be questioned when you consider the context—poor current compliance and no serious enforcement. Ambitious goals are less likely to succeed when they are understood from the very beginning to be unachievable. Enterprises are much more likely to take a "wait and see" attitude than to invest for pollution control. Allocations can be updated every five years, but a process that appears to move both directions at the same time—setting goals but then moving away from them—sends the wrong signals.

Finally, what if industry simply does not understand what is being asked of it? It is difficult to require compliance if the environment rules are not sufficiently clear. Industry and enforcement officials must understand their responsibilities. If the law or regulation does not have enough detail to guide the permitted party, it is difficult to blame the polluter.

CONCLUSION

Each country that seeks to construct a working system of environmental regulation must consider not only what pollution outcomes it wants to achieve, but also the opportunities and challenges posed by its own history and the basic nature of its existing institutions and legal and bureaucratic culture. If countries have limited history working under systems of law, law writing and legal reform alone will not do the job. Likewise, countries with limited experience with working markets as they are known in the West, or with very different approaches to incentives, must think hard before they put into place the MBIs that are increasingly being used in the United States. These are but two of the many considerations that are critical as countries consider what options they have to regulate pollution in an effective, rather than theoretical, manner.

Much of the advice in recent years to the developing world from the development and assistance organizations, however, has been focused on efficiency. Clearly, it would be preferable if environmental regulations could be designed in ways that maximize efficiency and the potential for cost savings. Even the wealthiest countries cannot afford to waste money, and the poorest societies, those that also have the most daunting environmental protection hurdles to cross, would be well advised to consider regulation that honored this principle. The dream of MBIs for environmental control was born in this central and very legitimate concern. And, in the right technological and institutional circumstances, economic instruments have shown their value as a way to reduce the overall costs of attaining environmental goals by minimizing compliance costs.

But effective efforts toward the goal of environmental protection must honor a number of principles, of which efficiency is only one. It does no good to design tools that are highly efficient, but do not work because they run headlong into ingrained ways of thinking about problem solving. Chief among these are very

distinct differences in how people think about or even experience laws and markets, what infrastructure and institutions are available to carry out particular approaches to environmental protection, and what motivates daily actions of the numerous stakeholders in each country.

For these reasons, any genuine effort to construct effective solutions will require a broad based conversation in society, not a series of technocratic responses. The conversation must reach out beyond narrow specialists such as technical experts or economists, who are, in any event, not the dominant voice in domestic environmental dialogue in the mature environmental regimes. The complexity of the choices involved demands a deep consideration of precisely the same factors identified by Stiglitz—governance, legal infrastructure, and institutions.[68] Until this point is internalized by the international advisors and by domestic experts tasked to manage the environment (who must be weaned from academic answers and begin to trust their instincts and very real understanding of how things actually work in their own societies), little progress toward domestic environmental protection or global environmental threats is likely.

68. *See* Stiglitz, *supra* note 2.