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Environmental Reforms in Poland

A Case for

By Halina Szejnwald Brown, David Angel, and Patrick Derr

The grim legacy of environmental degradation in Eastern Europe under Communist rule has been extensively documented in recent years. In Poland, technical and popular publications have reported this legacy in some detail: suffocating air in the major cities (especially in the heavily industrialized southwest), with levels of particulates and sulfur dioxide far exceeding those in Western Europe and the United States; widespread damage to historical structures and monuments; dangerous contamination of the soil by heavy metals; degradation of groundwater; and rivers so polluted as to be unsuitable even for agricultural use.¹

As it happens, environmental protection was a key theme in Poland's struggle for political transformation

during the 1980s, and environmental goals were enthusiastically embraced by Solidarity and other groups. Environmental issues also figured prominently in the historic "Round Table" discussions in 1989 between the Solidarity-led opposition, the outgoing Jaruzelski government, and the newly elected democratic leadership. One result of these discussions was the Environmental Protocol, which outlined a national environmental policy for the next decade that called for fundamental changes in Poland's environmental laws and institutions.

The blue ribbon commission assembled to implement the protocol (which consisted mostly of experts in environmental law and economics) soon abandoned the idea of radical change and instead—for strategic reasons—



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STILL PICTURES—DAVID HOFFMAN

Cautious Optimism

embraced a program of incremental reform. Much of this program is now in place. All environmental and conservation responsibilities have been consolidated in the new Ministry of Environmental Protection, Natural Resources, and Forestry, which early on announced an ambitious national environmental policy for Poland.² Working together, the ministry and Poland's parliament moved quickly to strengthen key parts of the enforcement system, increasing the powers and resources of the State Environmental Protection Inspectorate (PIOS), an independent monitoring and enforcement agency; closing loopholes in existing environmental laws; and increasing environmental use fees. More recently, efforts have been made to provide a statutory framework for two important regulatory

practices already entrenched in actual practice: negotiated compliance schedules for industry and increased access to information for the public.

In addition, the new program formally codified the industrial licensing process. All firms now have to obtain renewable permits from the environmental administrator in their region for water use; the discharge of wastewater or sewage into ground or surface water; emissions of air pollutants; and the disposal of solid and hazardous waste. Since 1991, applications for water use, air emissions, and waste disposal permits have had to include detailed descriptions of the technological processes the firm uses and the types and sources of pollution it generates as well as an analysis of the environmental impacts of the pro-



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One of many historical structures in Poland damaged by acid precipitation.

posed activity and a plan for meeting the applicable environmental standards. The regional or central authorities may also require a formal environmental impact statement, although these are usually only prepared for major sources of pollution. The permits specify discharge rates for the individual pollutants and fees for “the use of the environment” and commonly require improvements in process design and pollution control technologies.³ The penalties for noncompliance with these environmental permits have increased substantially.

This article analyzes the structure of Poland’s new environmental protection system, the assumptions that underlie it, and its prospects for improving the country’s environmental quality over the long term. The analysis includes a look at the system’s administrative infrastructure and its evolution over time as well as case

studies of five recently privatized industrial firms. Our conclusion is that the emerging system, which draws heavily on Poland’s human, legal, and institutional legacies, possesses the structural characteristics and resiliency to eventually achieve many of the goals it has set.

Western Misconceptions

The scope of the environmental degradation in Poland during the Soviet era led many western analysts to assume that Poland had neither an adequate legal and institutional framework for environmental protection and conservation nor the societal leadership and tradition necessary to develop and implement such a framework. This assumption is entirely false, however. Early in this century, Poland enacted pioneering laws dealing with the protection and preservation of natural resources, including the Water Law Act in 1922, the act creating the State Council for the Protection of Nature in 1925, and the Nature Protection Act in 1934. Owing to the efforts of the council, 6 national parks and 180 nature reserves were created by the late 1930s.⁴ Today, Poland has the only remaining vestiges of primeval European forest and the only thriving herds of European white bison.⁵

In the postwar period, Poland passed a series of progressive and innovative laws and developed sophisticated institutions, policy instruments, and technical expertise for environmental protection. For example, the 1949 Nature Conservation Act featured several provisions that two decades later would become the basis of the National Environmental Policy Act (NEPA) in the United States: It established a national environmental policy, articulated specific goals, introduced a requirement to assess the environmental impacts of major new projects, and set up a central agency to carry out its provisions. Over the next three decades, the Polish parliament and the executive branch created an

impressive body of environmental laws and administrative initiatives. Among other measures, the country adopted new civil and penal codes on pollution in the 1960s; introduced charges for the use and pollution of water in 1974 (arguably the first system of environmental use fees in the world); adopted a comprehensive Air Pollution Act in 1966, followed by numerous ambient air standards; and enacted a Water Act in 1974. This legislative activity culminated in the passage of the Environmental Protection Act in 1980. Compared with U.S. environmental legislation at the time, this act was remarkably progressive: It addressed all environmental media, as well as waste disposal, the protection of flora and fauna, and the protection of green areas within cities. It also extended the system of fees and fines for water use, in operation since 1974, to other environmental media.⁶

Notably, the many environmental efforts undertaken in Poland during the Communist period were initiated and promoted—with the tacit approval of the state—by intellectual elites within the National Academy of Sciences and the increasingly professionalized and pragmatic upper echelons of the Communist Party bureaucracy.⁷ In 1976, the Polish Academy of Sciences founded a research group on environmental law within its Institute of State and Law—the first such think tank in the Soviet bloc and possibly the first in Europe. Many of the individuals involved subsequently became leaders of the environmental movement within Solidarity and later, after the collapse of the Communist regime, led the ongoing reforms in Poland’s environmental protection system.

Thus, for four decades, Poland was an environmental paradox. On the one hand, it featured a sophisticated and innovative system for environmental protection; on the other, it endured some of the worst environmental degradation in Europe. The key to understanding this paradox is the realization that the reasons for the sys-

tem's failure were largely external, although the vague nature of the laws and ineffective administrative apparatus have to bear some of the blame.⁸ The centrally planned economy included such nonnegotiable realities as an emphasis on the development of heavy industry and mining; reliance on highly polluting and inefficient energy and industrial sectors; personal and economic disincentives for industrial managers to invest in pollution prevention; and a general shortage of capital for environmental protection.⁹ These political and economic factors all sharply subordinated environmental protection to industrial production, full employment, and economic growth. Furthermore, the state's control of information effectively concealed the true scope of the unfolding environmental disaster from all but a relatively tiny elite in the political, administrative, and academic sectors.¹⁰

The Reforms' Risky Foundations

Unlike their colleagues in the West, the intellectual and policy leaders in Poland who in 1989–90 chose gradual reforms instead of radical restructuring were keenly aware of Poland's conservation tradition, the strengths and weaknesses of the environmental protection system that they had created over the years, and most importantly, the disincentives that had systematically blocked implementation of sound environmental policies.

The strategic decision to adopt incremental reform was premised on three plausible but untested assumptions: First, that the laws and institutions inherited from the Communist

era were fundamentally sound; second, that the disincentives that had undermined enforcement of environmental laws were part of the discredited regime and would vanish along with it; and third, that confronted with both systemic change in the political and economic domains and incremental reforms in environmental law and enforcement institutions, regulatory authorities and industrial managers would in fact change their behavior.

Several considerations suggest that the third assumption is the most fragile. For example, some analysts predicted that decades of Soviet rule had left a legacy of collective disregard for the law.¹¹ Others believe that the market economy will increase, rather than decrease, economic pressures on private enterprises, and will thus create a powerful new disincentive to improving environmental performance.

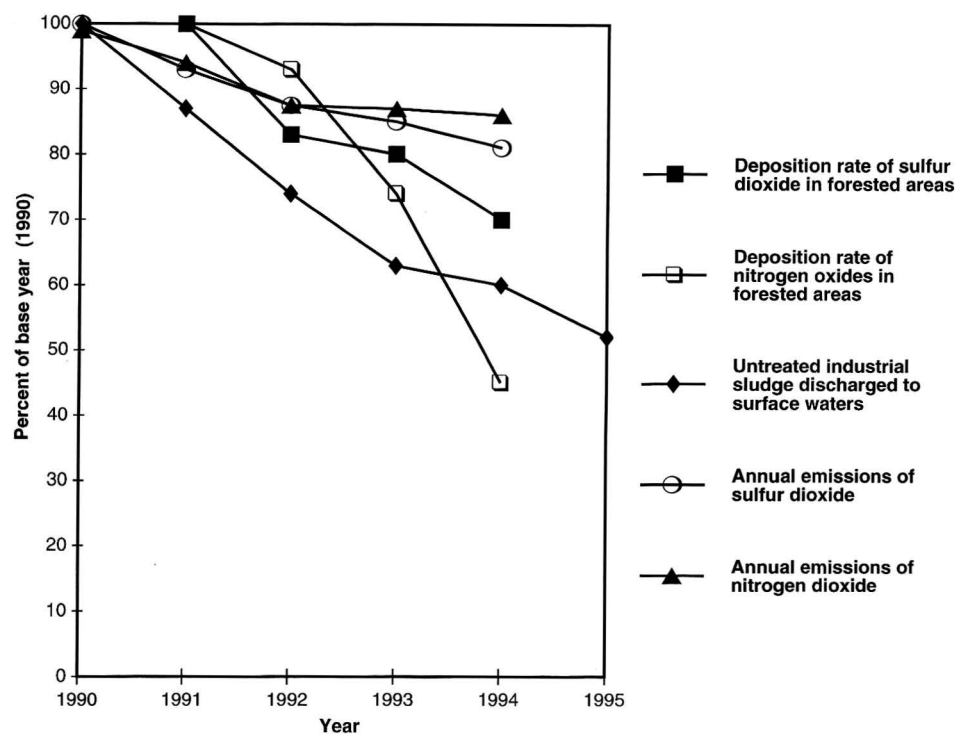
Unfortunately, there is no simple

way to test the three assumptions on which Polish environmental policy is being based. Examining trends in environmental quality is useful but not decisive. As Figure 1 on this page shows, air and water quality in Poland have improved since 1990. But these improvements could be due to factors unrelated to recent reforms in the environmental protection system, notably the decline of dirty industries, mitigation by a few large polluters, or the ongoing transition from an economy based on manufacturing to one based on services and trade.

In an attempt to avoid the ambiguities inherent in environmental quality trends per se, one analyst examined the effects of environmental fees and fines and concluded that since 1990 they have provided a significant economic incentive for pollution prevention.¹² As shown in Table 1 on page 33, fees for

(continued on page 33)

Figure 1. Trends in Poland's environmental quality, 1990–95



SOURCE: Central Bureau of Statistics, *Environmental Protection*, 1996 (Warsaw, 1996), 112, 128, 260.

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(continued from page 13)

air emissions have increased steadily since 1991, outpacing the rate of inflation. And as Figure 2 below indicates, revenues from environmental fees and fines in Poland increased dramatically between 1990 and 1995. While these statistics suggest that some policy instruments are having their intended effects, they do not unambiguously confirm the central assumptions of Poland's reform program.

A More Systematic Approach

To examine these assumptions in greater depth, we conducted detailed case studies of five recently privatized industrial firms (see Table 2 on page 34). All of these firms were of medium

Table 1. Emission fees for selected air pollutants^a

| Effective Date | Lead | Pollutant Sulfur dioxide | Benzene |
|----------------|------------------|-----------------------------|------------------|
| 1 January 1991 | 3.60 (\$3.80) | 0.07 (\$0.07) | 0.18 (\$0.20) |
| 1 January 1992 | 50 (\$38) | 0.10 (\$0.08) | 100 (\$77) |
| 1 January 1993 | 50 (\$31) | 0.10 (\$0.07) | 100 (\$63) |
| 1 January 1996 | 79 (\$36) | 0.25 (\$0.10) | 158 (\$72) |

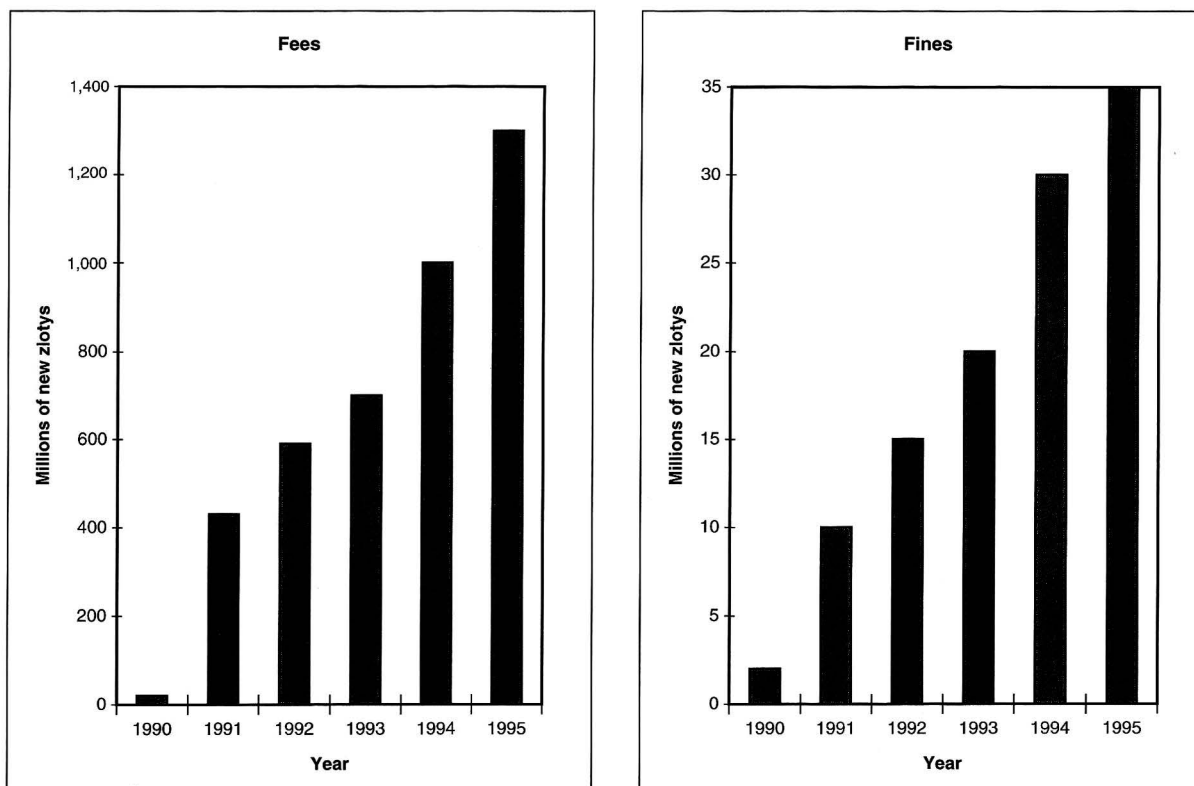
^aNew Polish zlotys per kilogram, with U.S. dollar equivalents in parentheses.

SOURCES: 1991–93: D. H. Cole, *Instituting Environmental Protection: From Red to Green in Poland* (New York: St. Martin's Press, 1997); 1996: Environmental Protection Agency, *Actualne Przepisy w Ochronie Środowiska* (Current regulations for environmental protection) (Koszalin, Poland, 1995).

size, and while subject to pollution control regulations, are not large enough to attract the attention of the Ministry of Environmental Protection. Rather, these

are "average" firms that are handled by regional (voivodship¹³) environmental regulatory authorities. In the current system, the voivodship's Division of

Figure 2. Environmental fees and fines in Poland, 1990–95



SOURCE: Central Bureau of Statistics, *Environmental Protection, 1996* (Warsaw, 1996), 386.

Table 2. The five Polish industrial firms studied

| | DRUMET | Radom Leather Tannery | Fama | Raffil | Majewski Pencil Factory |
|---------------------------|---|---|--------------------------------------|-----------------------|--|
| Location | Wloclawek | Radom | Wyszkow | Radom | Pruszkow |
| Year established | 1895 | 1972 | 1963 | 1917 | 1894 |
| Principal products | Steel cables and wires | Leather | Office and home furniture | Paints and finishes | Pencils |
| Principal markets | Domestic and international | Domestic | Domestic and former Soviet republics | Domestic | Domestic |
| Employees in 1996 | 900 | 400 | 630 | 260 | 300 |
| Year privatized | 1994 | 1995 | 1994 | 1995 | 1995 |
| Ownership | 80 percent private investment; 20 percent employees | 85 percent national investment fund; 15 percent employees | Three partners | 100 percent employees | 65 percent Majewski family; 35 percent employees |

SOURCE: Authors.

Environmental Protection (WWOS) issues the environmental permits that these firms require; enforcement is entrusted to the voivodship's Environmental Protection Inspectorate (PIOS).

As part of these case studies, we reconstructed the firms' environmental histories from the mid-1980s to 1996, using interviews, written documents, and observations during site visits. In almost all cases, we met with the firm's president, a high-level manager familiar with technical and economic matters, and the environmental manager. We also interviewed government officials in the local WWOS and PIOS offices. In addition, we interviewed high-ranking officials in the Ministry of Environmental Protection and major labor unions. Among the documents analyzed were applications for environmental licenses and environmental impact analyses; the environmental licenses actually issued; reports from monitoring programs and inspections by enforcement agents; orders imposing fines for noncompliance; appeals by the firms and the

responses of regulatory agencies (and in one case, court decisions); and related correspondence between the firms and regulators. Together, these case studies provide a significant test of the validity of the three crucial assumptions enumerated above.

The System's Perceived Legitimacy

After decades of lax enforcement, it is reasonable to ask whether regulators would be willing and able to compel firms to comply with regulations and whether firms would accept the legitimacy of the enforcement regime.¹⁴ Our case studies indicate that the answer to both questions is "yes." The strengthening of PIOS that has occurred since 1989, along with the standardization of licensing procedures, has clearly increased both the confidence of voivodship authorities and their commitment to enforcing the law. All the WWOS offices examined had required the submission of environmental permit applications by their firms; promptly issued environmental permits; collected environmental fees; and imposed sur-

charges on firms that were operating without permits. In one case, the authorities decided to close a facility for repeated failure to improve its environmental performance—even though this would mean the loss of several hundred jobs in a city with 20 percent unemployment. As one PIOS official that we interviewed remarked, "In the past, an inspector could indefinitely defer decisions. That is no longer the case." Another noted that "[t]he fundamental difference between the past and the present is that now if we do not do our job properly we will be fired!"

If the attitudes of regulatory personnel were surprising, those of the firms were even more so. Without exception, the managers of the five firms accept the current system of environmental fees. This is not because the fees are trivial. At DRUMET, for example, the fees represent 0.7 percent of total sales, while at Radom Leather Tannery fees and fines combined come to approximately 5 percent of fixed operating costs. Nor is it because the managers had a universally positive attitude toward these government-imposed business costs. DRUMET managers offered a long list of grievances about WWOS, including unreasonable emission rates and inflexibility about compliance schedules, but environmental fees were not among these complaints.

Company managers also regard the process of setting emission limits as fundamentally fair. When asked whether the ambient air quality standards were too stringent and whether it was unfair to consider existing background levels in issuing air emission licenses, the environmental managers at DRUMET and Raffil vehemently defended the process, citing the potential impact on public health of aggregated emissions from numerous sources.

Nevertheless, firms can and do challenge individual decisions they judge to be unfair or too burdensome. Using sophisticated legal and procedural tactics, Radom Leather Tannery success-

fully overturned all the major decisions WWOS and PIOS had made regarding it. Though less successful, DRUMET has appealed several decisions by WWOS. These cases do not appear to be exceptions: The deputy minister of environmental protection complained about receiving as many as 200 appeals from industrial enterprises in a single day.

These five case studies also indicate that average firms are not engaged in organized activity to challenge the systems for setting environmental standards, issuing permits, and formulating other regulatory policies. While high-level officials within the Ministry of Environmental Protection, Natural Resources, and Forestry described some sophisticated lobbying campaigns to influence particular environmental standards (primarily those for emissions related to the combustion of coal) or to redirect the funds collected from environmental fees and fines,¹⁵ such activity appears confined to larger firms and those in heavily polluting sectors.

From the case studies, it appears that the environmental authorities are well aware of the economic and social consequences of their licensing and enforcement decisions and are quite adept at balancing competing social objectives in making them. Overall, their decisions seem to be guided by three principles: to push firms to the highest level of pollution control that they believe to be technologically and financially feasible; to prevent acute threats to public health and the environment regardless of the economic cost to the firms or the community; and to reward firms that demonstrate a commitment to environmental improvements with more flexible treatment.

By way of illustration, WWOS required DRUMET—the most advanced firm in the study group—to dramatically upgrade its technology to meet increasingly strict standards for hydrochloride gas emissions. In this case, regulatory authorities were concerned about the public health impacts of these emissions on a nearby housing project and believed that the firm was financially capable of adopting cutting-edge emissions control technologies. By contrast, the Majewski Pencil Factory was allowed to operate without a permit (by paying modest surcharges) instead of being forced to pay fines for noncompliance with a permit. The regulatory authorities did this because the firm's activities were relatively benign environmentally and they did not believe that it could afford the technological innovations that would be needed to eliminate its emissions of solvents. On the other hand, the regional WWOS attempted to close the Radom Leather Tannery—despite the fear of layoffs—because of

the imminent environmental threats posed by its waste storage lagoon.

Avoiding Confrontation

One of the key factors enabling regulatory authorities to pursue environmental protection aggressively while recognizing other social values is their great familiarity with the facilities they regulate. The officials interviewed had a detailed knowledge of each firm's technologies, management and professional staff, environmental and occupational health history, environmental health and safety philosophy, and financial status. This knowledge stems from many years of regular interactions that have been maintained since the transition to democracy in 1989. Despite the growth of some government agencies, especially PIOS, most of the technical and administrative personnel now in these agencies were there before 1989. Similarly, four of the five company presidents are either long-term employees of their firms or came from senior posts in similar



A woodland in Białowieża National Park, which contains some of the last primeval forests in Europe.



The main commercial street in Radom, which is home to two of the industrial firms that the authors studied.

enterprises. Without exception, the environmental managers interviewed began working for their present firms in the 1980s, and most have been in their current professional specialties since before 1989.

Another factor underlying Poland's balanced approach to environmental regulation is the clear preference—for both regulatory authorities and firms—for negotiated solutions rather than confrontation. Every regulatory official interviewed stressed his or her belief that confrontation was the tool of last resort. They frequently made statements such as the following: "If we see good will on the part of the management, we make an effort to prevent their financial collapse"; "A repressive system does not work"; and "A punitive system is ineffective. We need to work with enterprises over long periods of time to make incremental improvements. Confrontation does not solve anything."

The Role of Environmental Professionals

The requirement that applications for environmental permits by both new and existing firms include sophisticated environmental impact analyses has expanded the role of environmental professionals in Poland. Nationwide, there are now several dozen ministry-certified firms specializing in the preparation of permit applications and environmental impact analyses.

In the case of small and medium-sized companies, these technical consultants have considerable influence

over the permit process. There appear to be two reasons for this. First, the terms of a permit can have a major economic impact on a firm: They specify the technological modernizations it must undertake, provide the legal basis for calculating environmental fees, and set the threshold for potential fines. These terms, in turn, are based on a consultant's assessment of the environmental impact the firm's proposed activities will have. Second, certified consultants appear to enjoy so much trust that neither firms nor regulatory agencies are likely to challenge their analyses and recommendations. In the cases studied, environmental permits were issued within days of the time the applications were first submitted and were virtually identical to the original application in both content and format.

The increasing role of environmental professionals further accentuates the corporatist character of Poland's environmental protection system. As we watched regional administrators and industrial managers go about the task of managing pollution, we were struck by the absence of other actors, such as nongovernmental organizations (NGOs), labor unions, and the public. To be sure, some recent environmental controversies have mobilized both NGOs and the public, but none involved small to medium-sized firms. For such firms, environmental problems are quietly solved by regulators and management, with indirect mediation by technical consultants. Given the decisive role that Solidarity

played in overthrowing the Communist regime and in putting the environment at the top of the transformation agenda in 1989–90, the rapid retreat of labor unions from environmental issues is especially striking. The case analyses and interviews with several top union and environmental protection and labor ministry officials clearly show that in free-market Poland, labor unions are more concerned about social benefits, employment security, and fair wages than the environment. They view investment in environmental protection as unimportant or, worse, as a direct threat to their social agenda.

The Role of the European Union

The desire to join the European Union (EU) has always been a central consideration for key policymakers within the government and for leaders of the environmental reform program in post-Communist Poland. It provided the initial impetus for the state's efforts to reduce transboundary air pollution and emissions from energy generation, to enter negotiations over water pollution in the Baltic Sea, and to consider improved public access to information. However, the promise of EU membership is better understood as reinforcing the environmental reforms already occurring than as initiating them. In Poland, the extensive mobilization of ideas, resolve, and resources to improve the environmental protection system was primarily an internal affair drawing on inherited human and institutional capital that external observers had widely underestimated.

Cautious Optimism

Our analysis of the Polish experience suggests that the assumptions underlying the ongoing reform program in Poland have been justified by developments to date and that the emerging environmental protection system has a fundamentally sound structure and good degree of resiliency. The structure includes laws, poli-

cies, institutions, and technical and policy expertise that have evolved over several decades and that, since 1989, have been incrementally reformed. The resiliency derives from the existence of an essentially good "fit" between this structure and the values and attitudes shared by regulators and the regulated community alike, particularly the belief that the regulatory structure is fundamentally sound and legitimate.

We are therefore optimistic that the environmental protection system in Poland will, over time, produce lasting improvements in pollution prevention and environmental quality. This is a cautious optimism, however, because some key questions remain unresolved.

First, if the economic recovery that Poland has enjoyed during the 1990s should falter, the resulting financial pressures on firms and political pressures on the government could severely test the priority given to environmental protection. Second, as a new generation of entrepreneurs, politicians, and administrators emerges, it is unclear whether they will maintain the same level of commitment to seeking negotiated and balanced solutions. Indeed, as memories of life under the Communist regime fade, the basic value systems and priorities may begin to diverge more sharply, possibly making the system more confrontational.

Third, the effective organizing and lobbying that has been practiced by a few key industrial sectors in Poland (most notably the energy sector) with regard to pollution standards and environmental regulations may spread to other sectors. As the private sector continues to grow in confidence and sophistication, medium and smaller firms may begin to organize and engage in lobbying activities.

In sum, we are guardedly optimistic that Poland's well-documented and toxic physical legacy will be successfully ameliorated by an emerging system that draws heavily on the country's less well-documented and much

more positive human, legal, and institutional legacies. Many questions about the future performance of the Polish system remain open. But the question asked in the euphoria of 1989—Should Poland scrap its entire system of environmental laws and regulations and rebuild itself on the U.S. model?—has clearly been answered in the negative. Perhaps it is not too much to hope that, in the future, one will be able to ask a new question: What can the United States learn from Poland?

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NOTES

1. See S. J. Kabafa, "Poland: Facing the Hidden Costs of Development," *Environment*, November 1985, 6; L. R. Ember, "Pollution Chokes East Bloc Nations," *Chemical & Engineering News*, 16 April 1990, 7; Institute of Environmental Protection, *Quality of the Environment in Poland* (Warsaw, 1990); B. Fischhoff, "Report from Poland: Science and Politics in the Midst of Environmental Disaster," *Environment*, March 1991, 12; and World Resources Institute, *World Resources 1991-93* (New York: Oxford University Press, 1992).
2. D. H. Cole, "Poland's Progress: Environmental Protection in a Period of Transition," *The Parker School Journal of East European Law* 2, no. 3 (1995): 279; and D. H. Cole, "Environmental Protection and Economic Growth: Lessons from Socialist Europe," in

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R. Malloy, P. Braun, and C. Braun, eds., *Law and Economics: New and Critical Perspectives* (New York: Peter Lang, 1995), 295.

3. Environmental Protection Agency, *Actualne Przepisy w Ochronie Środowiska* (Current regulations for environmental protection) (Koszalin, Poland, 1995).

4. See D. H. Cole, *Instituting Environmental Protection: From Red to Green in Poland* (New York: St. Martin's Press, 1997); J. Jendroska and J. Sommer, "Environmental Impact Assessment in Polish Law: The Concept, Development, and Perspectives," *Environmental Impact Assessment Review* 14, no. 2/3 (1994): 169; J. Jendroska, "Environmental Regulatory Framework in Poland: History and Recent Developments," in *Proceedings of a Workshop on Environmental Health and Safety in Private Enterprises in Poland* (Warsaw: Central Institute for Labor Protection, 1996); J. Jendroska, "Drafting New Environmental Law in Poland: Radical Change or Merely Reform?," in G. Winter, ed., *European Environmental Law: A Comparative Perspective* (Brookfield, Vt.: Dartmouth Publishing Company, 1996); and Cole, "Environmental Protection and Economic Growth: Lessons from Socialist Europe," note 2 above.

5. J. Perlez, "Polish Home that Bison Still Roam," *New York Times*, 25 August 1997, A1.

6. Jendroska, "Environmental Regulatory Framework in Poland: History and Recent Developments," note 4 above; Jendroska, "Drafting New Environmental Law in Poland: Radical Change or Merely Reform?," note 4 above; and Jendroska and Sommer, note 4 above.

7. See Cole, *Instituting Environmental Protection: From Red to Green in Poland*, note 4 above; and M. Hirszowicz, "The Polish Intelligentsia in a Crisis-Ridden Society," in S. Gomułka and A. Poloński, eds., *Polish Paradoxes* (New York: Routledge, 1990).

8. Jendroska, "Environmental Regulatory Framework in Poland: History and Recent Developments," note 4 above; and B. Hicks, *Environmental Politics in Poland: A Social Movement between Regime and Opposition* (New York: Columbia University Press, 1996).

9. See H. French, *Green Revolutions: Environmental Reconstruction in Eastern Europe and the Soviet Union*, Worldwatch Paper No. 99 (Washington, D.C.: Worldwatch Institute, 1990); K. Schmidt and M. Schnitzer, "Privatization and Management Incentives in the Transition Period in Eastern Europe," *Journal of Comparative Economics* 17 (1993): 264; M. A. Toman, "Using Economic Incentives to Reduce Air Pollution Emissions in Central and Eastern Europe: The Case of Poland," *Resources* 133 (1993): 18; L. K. Hubbell and T. M. Selden, "The Environmental Failures of Central Planning," *Society and Natural Resources* 7, no. 2 (1994): 169; and Cole, *Instituting Environmental Protection: From Red to Green in Poland*, note 4 above.

10. Cole, *Instituting Environmental Protection: From Red to Green in Poland*, note 4 above; and P. Gliński, *Polscy Zieloni* (Polish greens) (Warsaw: The Polish Academy of Sciences, 1996).

11. P. Sztompka, *Dilemmas of the Great Transition: A Tentative Catalogue*, Program on Central and Eastern Europe Working Paper Series, no. 19 (Cambridge, Mass.: Minda de Gunzburg Center for European Studies, 1991).

12. Cole, *Instituting Environmental Protection: From Red to Green in Poland*, note 4 above.

13. A voivodship is an administrative district; there are 49 such districts in Poland.

14. R. Greenspan Bell, "Lessons Learned in the Transfer of U.S.-Generated Environmental Compliance Tools: Compliance Schedules for Poland," *Environmental Law Reporter*, June 1997, 10,296.

15. One recent proposal, for instance, would allow firms to spend these monies on environmental improvements directly instead of paying them to the government.