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Lessons from Mexican Industry**

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## **Is NACEC a Model Trade and Environment Institution? Lessons from Mexican Industry**

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### **Abstract**

This chapter evaluates the extent to which NACEC serves as a model for more effective trade and environmental institutions by examining the institution's role in abating industrial pollution in Mexico. Despite some notable improvements in levels of industrial pollution, the environmental costs of trade-led economic growth in Mexico have remained high in the post-NAFTA period. NACEC is not playing a significant role in channeling this growth toward sustainable levels of development. However, it wasn't designed to, and should not be evaluated on those terms. Indeed, NACEC was designed with more modest goals that are evaluated in detail throughout this volume. This paper argues that NACEC has a number of the elements of an institution that could facilitate the balance of economic growth and environmental protection. An outline is provided regarding how these elements could developed in the context of other trade agreements such as the proposed Free Trade Area of the Americas (FTAA).

### **I. Introduction**

There is now an emerging consensus that "increased trade and growth without appropriate environmental policies in place may have unwanted effects on the environment." (Fredriksson, 1, 1999). While the debate over the most appropriate mechanisms to couple trade-led growth with environmental policy is still hotly contested, many advocate the creation of trade and environmental institutions as a partial solution (Esty, 1994; Runge, 1994). NACEC, along with the North American Development Bank, are the first institutions of this kind in the Western Hemisphere. As debates over the trade and environmental linkages of the proposed Free Trade Area of the Americas (FTAA) continue, it is useful to ask whether NACEC serves as a model for a hemispheric institution that could be charged with mitigating the effects of economic integration on the environment in the Americas.

Following this short introduction, the chapter is divided into five additional parts. The second section provides an overview of levels of industrial pollution in Mexico. The third section outlines the results of various studies that have delineated the determinants

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of sustainable industrial policy for Mexico and juxtaposes these determinants with the performance of efforts by the Mexican government to abate industrial pollution. The fourth section examines the extent to which NACEC's work of is augmenting those efforts. The fifth section highlights elements of NACEC that could serve as the basis for trade and environmental institutions for other trade agreements. In the final section the arguments are summarized.

## **II. Trade Liberalization and Industrial Pollution in Mexico**

Through a number of successive changes during the 1980s and 1990s, Mexico dismantled its industrial policy of Import Substituting Industrialization (ISI) to become one of the most open economies in the world (OECD, 1996). These policy shifts dramatically changed levels of production, trade, and investment in Mexico. One of the most significant changes has been the emergence of manufactures as both Mexico's chief export and its largest recipient of foreign direct investment (FDI). These changes have not proved to benefit the environment in Mexico.

Environmental degradation in Mexico during this period has been severe. It has been estimated that the annual environmental costs of economic growth amount to 10 percent of annual GDP in Mexico from 1988 to the present (World Bank, 2001).<sup>2</sup> For 1998, ten percent of Mexican GDP amounts to \$43 billion United States dollars (World Bank, 1999). Considering the fact that Mexican GDP only grew at 4 percent annually during this period, net levels of economic growth from this perspective are -6 percent on an annual basis. The environmental costs of growth are not difficult to see: less than ten percent of wastewater from industry, agriculture, and households is properly treated. Barely 35 percent of solid and hazardous waste is disposed of in a sanitary manner; and dramatic losses in biological and genetic diversity are occurring (World Bank, 2001).

Air pollution accounts for more than half of the environmental damage estimates in Mexico—the equivalent of \$27 billion worth of damage in 1998. Mexico City has long been one of the most polluted cities in the world. While significant reductions in levels of carbon monoxide (CO), lead (Pb), and Sulfur Dioxide (SO<sub>2</sub>) have occurred, serious problems persist for ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), and particulates. Standards for particulate matter are the most frequently violated in Mexico City, followed by violations in ozone standards, which are surpassed 80 percent of days each year since 1988 (Molina and Molina, 2000). The shifts in Mexican industrial policy outlined above are changing the regional distribution of production in Mexico, bringing alarming levels of air

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<sup>2</sup> An earlier estimate for 1985, albeit conducted with slightly different methodologies, suggested that the environmental damage costs amounted to 7.6 percent of GDP for that year, indicating that perhaps environmental degradation has worsened (van Tongeren et al, 1993).

pollution to industrial centers. For example, air pollution standards are now exceeded 90 percent of days each year in Guadalajara (DOE, 2001).

Exposure to particulate matter and ozone have the most severe effects on human health among air pollutants in Mexico (Margulis, 1996). A consistent finding among those examining the health effects of air pollution in Mexico is that each 10 ug/m<sup>3</sup> increase in levels of PM<sub>10</sub>, causes an increase of daily mortality of 1 percent. Therefore, a 10 percent reduction in levels of PM<sub>10</sub> could avert as many as 1,000 deaths per year (Molina and Molina, 2000).

Industry is a significant contributor to levels of air pollution in Mexico's industrial centers. As shown in Table 1, industry contributes 41 percent of the particulate matter emissions in Mexico City, 89 percent in Monterrey, and 21 percent in Guadalajara. Industry is also a significant NO<sub>x</sub> polluter, ranging from 8 to 35 percent of total NO<sub>x</sub> emissions in some cities. NO<sub>x</sub> not only causes its own health and environmental problems, but along with SO<sub>2</sub>, contributes to the secondary formation of particulate matter and ozone. Industry is the most significant SO<sub>2</sub> polluter, at 62 percent of SO<sub>2</sub> emissions in Mexico City, 92 percent in Monterrey, and 68 percent in Guadalajara. Industrial activity also causes significant environmental problems other than air pollution in Mexico, water pollution key among them.

**Table I**

<b>Industrial Air Pollution as a Percentage of Total Air Pollution in 5 Mexican Cities</b>					
	<b>PT</b>	<b>SO<sub>2</sub></b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>HC</b>
<b>Guadalajara</b>	21%	68%	0.15%	8%	3%
<b>Monterrey</b>	89%	92%	0.36%	35%	4%
<b>Mexicali</b>	3%	75%	1.77%	9%	3%
<b>Toluca</b>	34%	82%	0.08%	10%	7%
<b>Mexico City</b>	41%	64%	0.39%	24%	3%

Source: Estadísticas del Medio Ambiente, Mexico 1999 (Tomo II)  
 Mexicali Inventory Inventory Group Binational Advisory Committee

Industrial pollution has not improved during Mexico's transition from ISI to trade openness. Recent work has shown that Mexican industry was more air pollution intensive in 1990 than during the period of ISI (Jenkins, 1998). Furthermore, estimates have shown that industrial air pollution has close to doubled in Mexico since 1994 (Gallagher, 2002).

What determinants cause levels of industrial pollution to improve in Mexico? Is the Mexican government making significant efforts to reduce levels of industrial pollution? Is NACEC assisting in such efforts? A discussion of these questions follows.

### III. Determinants of Sustainable Industrial Policy in Mexico: Outline and Scorecard

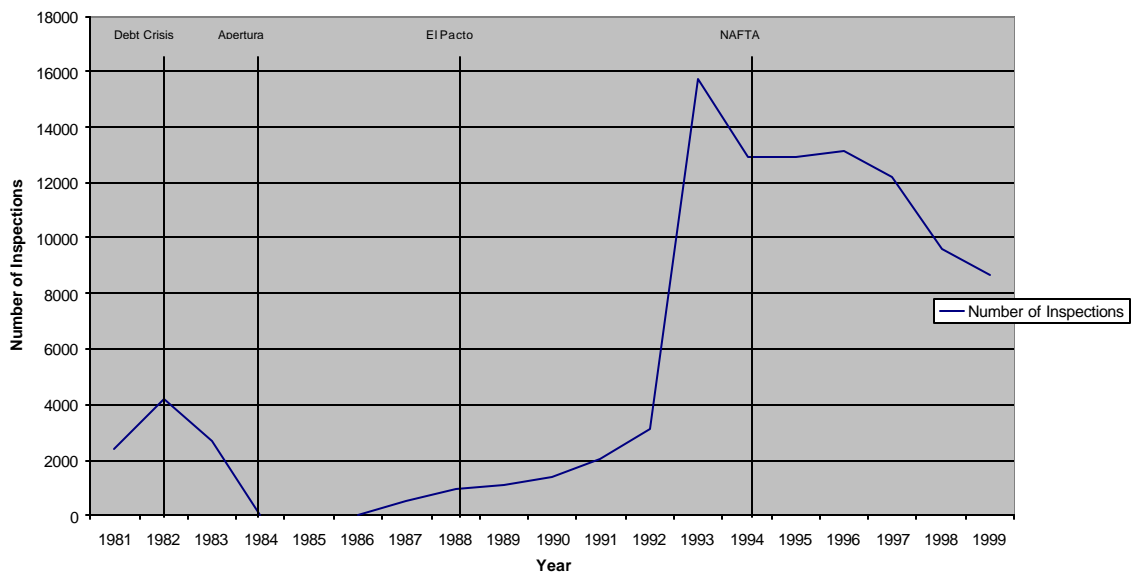
This section outlines the key factors that are understood to lead to improvements in levels of industrial pollution in Mexico, and reviews Mexican efforts toward these ends. These factors can be grouped into three broad categories:

- Increased levels of enforcement.
- New funds for modernization, pollution-control equipment, and environmental management systems.
- Public scrutiny of environmental practices.

With a few very positive exceptions, Mexico's record toward these three ends has been inadequate.

**Figure 1: Plant Level Environmental Inspections by Mexican Authorities, 1981-1999**

source: PROFEPA, 2000



### ***Enforcement***

Consistent with global comparisons, a number of studies have found that firms that are subject to government enforcement and inspection measures are likely to be significantly “cleaner” than their counterparts. Based on surveys of 236 industrial firms in Mexico, the World Bank found that regulatory requirements and enforcement were the primary reason why those firms that were in compliance with environmental regulation in 60 percent of the firms surveyed (Dasgupta et al, 2000).

Unfortunately, the majority of firms are not in compliance, and overall levels of inspections are decreasing. Mexico’s record on enforcement and inspections has been very poor. Figure 1 shows that after years of very scant amounts of plant-level environmental inspections, Mexico began to emphasize enforcement during the NAFTA negotiations, presumably due to pressure from its negotiating partners. Although the trend was going in the right direction, reaching its highest point in 1993, plant-level environmental inspections peaked at only 6 percent of all firms in the country (PROFEPA, 2000). What is worrisome is that after NAFTA was passed, the number of plant-level inspections began to diminish precipitously, suggesting that since NAFTA Mexico has become less serious about enforcement.

Although the overall trends in enforcement in Mexico are disappointing, there are a few success stories. There is evidence that the majority of inspections were concentrated in a few industries, mainly the chemical-petrochemicals, metal mechanics, and pulp and paper industries. Positive results have been documented in the chemical fibers, and steel industries. In addition to government enforcement, such gains were also due to external influences and market pressure. In these two industries, changes in environmental management were also in part because their foreign owners, customers, or governments in foreign markets demanded such measures (Mercardo, 2000; Dominguez-Villalobos, 2000).

### ***Appropriation of Additional Funds***

Another key determinant of firm-level compliance with environmental regulations in Mexico has been whether can mobilize or gain access to the necessary funds to modernize their energy and production equipment, install end-of-pipe technologies, switch to less environmentally damaging fuels, initiate cogeneration programs, and establish environmental management systems (Vijay, 2000; Brown, 2000; Gallagher, 2002; INTECH, 1997).

Mexico’s LGEEPA sets out general guidelines for reducing pollution, and refers to Normas Oficiales Mexicanos for specific regulations. Budgetary support has slightly

increased for environmental programs in Mexico (Logsdon and Husted, 2000). However, at the federal level, Mexico provides little funding for firms to come into compliance with the law. Firms are therefore left to their own devices to comply. For this reason, the record has been mixed.

The firms that are most likely to appropriate necessary funds for environmental controls are large ones (Dasgupta et al, 2000; OECD, 1998). Large firms are easier for governments and citizen groups to monitor, and should have lower costs for environmental compliance at the margin. Larger firms are also more apt to be the recipients of FDI, which can bring newer environmental technologies (Esty, 1997). However, only two percent of all firms in Mexico are categorized as large, and many smaller firms are more pollution intensive (INEGI, 1993; Aguayo and Gallagher, 2001). The rate of growth in value added production for all of Mexican industry from 1988 to 1998 was 4.3 percent annually, approximately the same rate as the economy as a whole. However, this average is masked by large increases in production and investment in a few industries such as automobiles and electrical machinery, while others declined sharply during the period (INEGI, 2000).

Many firms could not voluntarily increase levels of compliance –many industries were falling behind and simply could not afford to step up environmental protection. An example is the Mexican textiles industry. Textiles production dropped during the period of trade opening, and funds were not available for environmental management. Any funds appropriated for environmental management in the textiles industry were a function of government and community policing activities (Brown, 2000).

Conventional wisdom holds that another source of new funds for environmentally sound technology can come in the form of FDI. It is generally assumed that OECD-based multinational entities transfer clean technologies to developing countries through the liberalization process (Esty and Rodriguez, 1997). In the case of Mexico this has only been partially true. The World Bank survey mentioned above did not find “a significant role for *any* OECD linkage: multinational ownership, trade, management training, or management experience” (Dasgupta et al, 2000, iii). However, case study research in the chemical and steel industries, has found that FDI has brought new technologies and environmental management systems (Garcia-Johnson, 1999; Mercardo, 2000; Dominguez-Villalobos, 2000; Mercardo, 2000; Dominguez-Villalobos, 2000; Gentry, 1997).

A recent study has presented the hypothesis that when FDI occurs in sectors where pollution is largely a function of core technology (or plant vintage), then FDI can benefit the environment. However, when FDI occurs in sectors where pollution is a function of end-of-pipe technologies, and such technologies are not enforced in the host country, FDI is not beneficial to the environment. Indeed, the Mexican food and beverages sector is one of the largest recipients of FDI in Mexico. These sectors, where

pollution control is largely a function of the need for end-of-pipe solutions, are the biggest contributors to industrial air pollution in Mexico. They are not regulated by federal law (Gallagher, 2002).

### ***Community Pressure***

Scrutiny by local communities has also been found to exert significant influence over the environmental behavior of Mexican industry. The World Bank study shows that public scrutiny has been an effective tool to steer industrial firms toward environmental compliance. Indeed, these factors were reported to be important drivers of environmental compliance in 25 percent of the firms showing improvements in the sample (World Bank, 2001). This effect was particularly strong for firms that were publicly traded. The logic is that firms that are traded publicly are held more accountable because "news" of environmental performance can more easily affect their stock performance (Dasgupta et al, 2000). Because of data limitations, it is difficult to gauge the level of community pressure on industry in Mexico. Some case study evidence has shown that community pressure has been a key driver of environmental compliance in Mexico, and may be growing. (Brown, 2000; RMALC, 2001).

This section has outlined the state of Mexican efforts toward improving compliance toward environmental regulation. The overall trends are quite poor. Levels of enforcement are decreasing, and few additional funds are available for pollution control equipment. However, there are signs of improvement in a few key polluting sectors, such as chemicals and steel. In these two cases, a blend of enforcement, private investment, and community pressure have been the drivers of increasing levels of environmental performance.

## **IV. Does NACEC Make a Difference?**

Does NACEC bring significant levels of additional support to public and private efforts toward industrial environmental protection in Mexico? It is widely recognized that NACEC does not have the mandate or resources to make a very significant contribution. However, given its rather restricted focus, NACEC has received favorable reports. Although the institution is not currently capable of solving trade and environmental problems in North America, NACEC does have a number of elements that could serve as the basis for an institution that could balance growth and environmental objectives in North America and beyond.

A consensus is emerging in the literature regarding evaluations of the effectiveness of environmental institutions. Institution should be evaluated based on



"dimensions defined by institutional goals and end points defined by institutional goals" (Bernauer, 377, 1995). Positivist political analysts agree that NACEC was created to give pro-trade "swing" Democrats in the United States political "cover." Many environmental groups, and their constituencies mandated an environmental component of NAFTA. Such a component had to be strong enough to appease environmental groups, but weak enough to appease business and the rest of Congress (Mayer, 1998; Audley, 1997). Such analyses have been echoed in the policy community. While environmentalists criticized the final product, conservative think-tanks praised it. According to the Heritage Foundation "although these side agreements are troublesome and establish worrisome precedents, the protectionists are correct: they are largely meaningless" (Smith, 1, 1993). In addition, the CATO Institute said, "fortunately, the mechanism of the side agreements has not met the hopes of its supporters or the fears of its critics" (Hudgins, 3, 1997).

NACEC's goals are to develop recommendations on harmonization of environmental regulations "without reducing levels of environmental protection." They are to "encourage" effective enforcement of, and compliance with, environmental laws. In addition, they are charged to "promote" and develop recommendations regarding public access to environmental information, and appropriate limits for specific pollutants. They also play a role in dispute minimization and resolution. Lastly, they are to consider the environmental implications of NAFTA, including environmental impact assessments of projects with transboundary effects, information sharing regarding these projects, and mitigation of potential effects (NACEC, 1998).

By and large, NACEC is seen as an institution that carries out this limited mandate quite efficiently. Acknowledging that "the side agreements crafted by the Clinton Administration in 1993 stretched the patience not only of Mexico and Canada, but also of Republicans in the US Congress," a recent study argued that the relevant way to evaluate NACEC (and other parts of NAFTA's environmental package) was to juxtapose it with a counterfactual not of tougher provisions, but of no agreement at all. In this study, the authors concluded that NACEC had a number of achievements and shortcomings in meeting its goals, but that overall its performance was seen as positive. (Hufbauer et al, 2000).

That said, NACEC seems largely ill-equipped to help solve Mexico's significant environmental problems. In addition to lacking the necessary mandate, NACEC lacks resources to counter these problems. By its very nature, an institution with an annual budget of \$9 million can hardly make a dent in a series of problems that cost the Mexican economy over \$40 billion annually. The actual amount of funds spent on environmental projects is less than half of the \$9 million; the projects budget is closer to about \$3 million per year. Additionally, another \$ 1 million supports the North American Fund on Environmental Cooperation (NAFEC), discussed later in the chapter. Remembering that the environmental costs of air pollution in Mexico amount to over \$25 billion

annually, I conducted an analysis of NACEC budgets to estimate the amount of funds earmarked for air projects. Since NACEC’s inception, we estimate that \$2 million in grants and loans (about \$200,000 in loans) have gone to air related projects (NACEC, various years).

## **V. NACEC: Elements of an Effective Trade and Environment Institution**

NACEC has set an important precedent for trade policy. Because of NAFTA’s incorporation of environmental considerations, trade policy is no longer seen as separate from environmental policy (Marc-Johnson, 1996; RMALC, 2000). Although NACEC was not designed to significantly reverse the environmental consequences of economic growth in Mexico, it serves as a pilot project to examine how effective trade and environment institutions could be designed for Mexico and other developing.

As discussed earlier in the chapter, reducing the environmental costs of industrial growth entails providing new funds for environmental management, enforcing existing standards for environmental policy, and empowering citizens to exert pressure on firms to comply with those standards. With respect to industrial pollution in Mexico, NACEC performs three tasks that are essential for any such institution: it provides additional funds for environmental management for small and medium sized enterprises and for communities; it provides a mechanism for citizen’s groups to challenge whether nations are enforcing their environmental standards; and it convenes essential research and policy discussions among governments and civil society in Mexico and its North American trading partners. This section of the paper discusses these elements in greater detail.

### **A. Defraying the Environmental Costs of Economic Growth**

For Mexico to develop a sustainable economy, it needs additional funds to defray the environmental costs of economic growth, which now amount to over \$40 billion each year. NACEC’s Fund for Pollution Prevention Projects in Mexican Small and Medium Sized Enterprises (FIPREV), and its North American Fund for Environmental Cooperation (NAFEC) are both new sources of funds for industry and communities. Although these funds do not have adequate resources to significantly reduce the environmental costs of industrial growth in Mexico, they serve as models for Mexico and for mechanisms that could be established in the context of the FTAA.

Created in 1996, FIPREV is a pilot fund for pollution prevention projects in small and medium sized enterprises in Mexico. After an initial period of assessment, the fund now has over \$2 million, and has given over 25 loans amounting to \$610,000. Not only did NACEC provide funds for FIPREV itself, but was able to leverage funds from other sources.

FIPREV was established through a collaboration with the Mexican Fund for Technology Transfer in Small and Medium Sized Enterprises (FUNTEC). FUNTEC is a non-governmental organization linked to the Mexican Federation of Industrial Associations (CONCAMIN). FIPREV was founded to “promote the use of pollution prevention techniques and technologies among small and medium sized Mexican industrial establishments and support them in the development of their environmental management capacities,” and to “facilitate the application of pollution prevention measures in industry through the timely and appropriate offering of technical assistance, information, and financing for projects of this nature.” (NACEC, 2000) The administration of FIPREV brings together members of business, academia, government, and representatives of NACEC’s Joint Public Advisory Committee (JPAC).

Based on a series of preliminary needs assessments, the majority of FIPREV’s projects are in the tanning industry, however other loans have been granted to firms in the food, metalworking, electroplating, chemicals, foundry, dry cleaning, and other manufactures. FIPREV’s low interest loans can amount to \$30,000 or 80 percent of an investment project. They are most often offered in Mexican pesos but can come in the form of US dollars if the firm is exporting its goods or services. To date, most of these loans have come in the form of technical assistance to firms to make process-based technological changes to reduce water and raw materials usage. Impressively, of the 25 loans thus far granted by FIPREV, all firms have repaid both the credit and interest according to schedule. Based on the annual savings of approximately 1,465 tons of chemical substances, FIPREV estimates that the economic benefits of these environmental programs have amounted to \$646,000 each year since their inception (NACEC, 2001).

NAFEC was also established by NACEC in 1996, and its mission is to provide grants to community-based NGOs for social and environmental projects in the three countries. Since its inception, NAFEC has issued over 142 grants for a total of \$5.4 million. The average grant is approximately \$30,000.

Relatively few grants have been issued to help communities monitor Mexican industry. Little more than \$200,000 has gone toward projects related to industrial pollution in Mexico (NACEC, 2001). However, the grants that have been issued for community-based monitoring of industrial activity have been quite effective. In 1998, \$50,000 was given to the U.S. based Environmental Health Coalition for a US/Mexico Comparable Industries Study on pollution prevention. Under this grant, a number of U.S. and Mexico NGOs worked together to identify the toxic chemical uses at three maquiladoras. Short fact sheets were put together based on the findings and distributed to the public to encourage their involvement in subsequent negotiations with the companies. Indeed, the groups then entered into negotiations with those firms to reduce emissions and to implement pollution prevention strategies.

In 2000, grants totaling \$45,000 were issued to a Mexican NGO named Enlace, Ecologico in Agua Prieta, Mexico. The grant was given for the community use of the Pollutant Release and Transfer Registry in Mexico. Enlace Ecologico created a pilot project in Agua Prieta and Nogales to test how NGOs can monitor and list pollutant releases in their communities. The groups will then work with 100 maquiladoras to assist them in reporting their pollutant releases. Industry leaders and community members will then be encouraged to create ongoing monitoring systems and dialogue concerning abatement strategies (NACEC, 2001).

## **B. Monitoring the Enforcement of Environmental Laws**

NACEC has two mechanisms that provide additional means to monitor the enforcement of environmental laws in North America. Articles 14 and 15 of NAAEC allow citizens make submissions to NACEC regarding the failure of a NAFTA party to enforce its environmental laws. Secondly, Article 22 allows any of the three NAFTA governments to enter into a dispute resolution process with parties that persistently fail to enforce environmental laws.

Under Articles 14 and 15, if a submission is accepted by NACEC, NACEC commissions and publishes factual record. If a factual record deems that environmental law was continually violated, there are no requirements that action has to be taken. However, it is hoped that increased public attention to the matter will trigger government action. There is evidence to suggest that such public attention can induce change. The NGO that issued the submission that resulted in the factual record to investigate alleged violations due to the development of the Cozumel Pier has gone on record to say that the factual record led to improvements in environmental impact assessment, and the eventual establishment of a fund for reef protection (Garver, 2001). For Article 22, nations found in violation can be fined and after a long process can eventually have NAFTA privileges suspended. Citizen submissions have been issued for cases related to industrial pollution in Mexico but thus far Article 22 has not been exercised at all.

Since the Article 14 and 15 processes are covered in great detail in other parts of this volume, all that will be presented in this chapter is an illustration of a submission that has been filed regarding industrial pollution in Mexico. A Mexico based human rights NGO has filed a submission charging that the Molymex corporation, a company that processes residues generated by copper smelting firms, has violated environmental impact and air pollution standards in Mexico.

According to Mexico’s General Law of Ecological Equilibrium and Environmental Protection (LGEEPA), all firms must file an environmental impact statement upon establishing operations. Once a firm is in operation, there are a number of standards that are required, including a series of “norms” for air pollution. The submitters allege that Molymex failed to conduct an environmental impact assessment of

its operations. In addition, the submitters claim that the plant is violating Mexican standards that establish limits for SO<sub>2</sub> and particulate matter of ten microns or less (PM<sub>10</sub>).

This submission is still pending and it is not clear whether it will warrant a factual record. Regardless of its outcome, it serves as a clear example of citizen-based efforts to supplement enforcement activities regarding industrial pollution in Mexico. Earlier in this chapter, Figure 1 exhibited how Mexican efforts toward environmental inspections are on the decline. Articles 14 and 15 offer a way to counter that trend.

### **C. Cooperation, Research, and Information**

In addition to providing additional funds and an additional forum to monitor environmental enforcement efforts, NACEC also serves as a meeting place for cooperation, research, and information-sharing among the three countries. Before NAFTA, there were limited opportunities for trilateral activities of this nature (Mumme and Duncan, 1997-1998).

Given its limited budget, perhaps NACEC's largest contribution is in the realm of enhancing environmental cooperation among the three governments. NACEC's five program areas (Environment, Economy, and Trade; Biodiversity and Ecosystems; Pollutants and Health; Capacity Building; and Law and Enforcement Cooperation) have all served as forums for governments and civil society to convene on their respective issues.

Highlights among these projects have been the development of a framework methodology for assessing the environmental impacts of NAFTA, which resulted in a number of commissioned studies that were presented at a NAFTA Effects Conference held by NACEC in 2000; the development of a North American Biodiversity Information Network; work toward the development of a North American Pollutant Release and Transfer Register as well as a North American Air Emissions Inventory; the development of a capacity building program for pollution prevention that links the work of FIPREV with similar activities in the U.S. and Canada; and a North American Regional Enforcement Forum that brings together experts to discuss efforts to create better incentives for environmental enforcement.

While these efforts are positive, they have been criticized as being too disparate. Although many of these programs could be synergistic, they often are not coordinated with each other. Because of this it has been recommended that NACEC focus on a narrower range of issues (NACEC, 1997).

## **Foundations for an Environmental Component of the FTAA**

This chapter has emphasized two points. First, it is well documented that overall levels of environmental degradation are not improving in Mexico, and that industry continues to be a significant contributor to such degradation. Second, while it has been shown that NACEC is ill-equipped to combat the environmental costs of industrial growth in Mexico, it does have a number of positive elements that can serve as a basis for future institutions. This final section of the chapter outlines how such elements of NACEC could be broadened to lay the foundation for an effective institution that could manage the environmental component of the economic integration process in the Western Hemisphere.

To reiterate what was said earlier, de-coupling industrial growth from environmental degradation entails the development and enforcement of environmental regulations, the allocation of additional funds for new technologies and management systems for industry, and the enhancement of community-based efforts to monitor industrial environmental behavior. If given the needed resources, the positive elements of NACEC outlined above could be part of an effective hemispheric institution.

Estimates of the environmental damage costs for the entire hemisphere do not exist, but it can be safely assumed that billions of dollars are needed to couple economic integration with sustainable development. Indeed, the World Bank and the Inter-American Development Bank pledged over \$20 billion in loans, grants, and credits to prepare for the FTAA (New York Times, 2001). If an agreement is finally reached on a FTAA, many more resources will be needed to make it work.

With adequate resources, FIPREV and NAFEC-like funds could be part of larger efforts to link the FTAA with sustainable development. Upgrades in core technology, especially in firms that are both capital and energy intensive, are among the best strategies for pollution abatement in industry (INTECH, 1997). A well-funded FIPREV-like fund could provide assistance for efforts to modernize core technologies within firms as well as giving assistance for process-based changes that FIPREV already provides. Like FIPREV, such a fund could leverage funds from other sources. The World Bank's Guadalajara Environmental Management Pilot can serve as an additional model. Under this project, the World Bank matched funds issued by larger companies to help "green" their small and medium sized suppliers.

Coupling support for industry with community-based monitoring systems in a NAFEC-like fund could be an important strategy to ensure environmental compliance in the hemisphere. NAFEC-like grants could be administered to local communities to monitor firms environmental behavior, educate their communities regarding such behavior, and enter into negotiations with industries over compliance strategy. If

continued non-compliance occurred and was well-documented by these community groups, additional funds could be obtained to assist NGOs in Article 14 and 15 type citizen submissions.

At minimum, provisions like Article 14 and 15 of NAAEC should be included in an FTAA. This chapter, as well as others in the volume, have shown that enhancing the rights of citizens in this manner has proved to be quite effective under NACEC in the few cases when it has occurred. Indeed, the prospect of elevating such rights even further, in the form of "citizen suits" analogous to similar provision in U.S. environmental law, should also be considered. NAFTA's Chapter 11, discussed elsewhere in this volume, enables corporations to sue governments over environmental law, citizens should be enabled to sue corporations to provide a countervailing balance.

A hemispheric institution for clean production should also serve as a clearinghouse for research, cooperation, and collaboration among governments and civil society. Providing technical assistance, monitoring environmental progress, and serving as a forum for the exchange of information and ideas should all be part of such a strategy. Finally, a trade and sustainable development institution for the hemisphere should also include public participation and input at all levels of its operations.

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