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Third North American Symposium on Assessing the Environmental Effects of Trade: Investment, Growth and the Environment

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Commission for Environmental Cooperation

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Preface

The Commission for Environmental Cooperation (CEC) was created established by Canada, Mexico and the United States under the North American Agreement on Environmental Cooperation (NAAEC), commonly referred to as the environmental side agreement to the North American Free Trade Agreement (NAFTA). The CEC consists of the Council (which is composed of the environment ministers from Canada and Mexico and the Administrator of the US Environmental Protection Agency), a Secretariat and the Joint Public Advisory Committee (five members of the public from each of the three NAFTA countries). It was designed in part to address fears that a regional trade agreement between a developing country and two developed countries—the first and largest such trade agreement—would have significant negative overall environmental impacts. A notable concern was that industry would be drawn to jurisdictions with lax environmental laws or weak enforcement, and that this would lead to a "race to the bottom" in environmental standards and enforcement of environmental law.

As part of its efforts to respond to these concerns, in 1999, the Council decided that the CEC would hold a symposium assessing the linkages between trade and environment. Instead of relying solely on in-house capacity for these analyses, the CEC has elected to issue public calls for proposals for research papers; a trinational multidisciplinary advisory group selects those to be presented. That first symposium was held in Washington, DC, in 2000, in partnership with the World Bank. Further symposia were held in Mexico City, Mexico, in partnership with the United Nations Environment Program, and the third, the subject of these proceedings, in fall 2005 in partnership with International Trade Canada and Foreign Affairs Canada. Each symposium has brought together between 200 and 300 trade and environment stakeholders and experts to hear and discuss research findings presented by independent scholars on various topics that examine trade impacts on the continent's environment. Altogether, more than 50 papers have been generated among the three symposia, along with the development and refinement of an analytical framework intended to document the environmental impacts of NAFTA (for a list, see the annotated bibliography on the CD).

This third symposium marked an historical turn. The independent ten-year review of the CEC was presented to the Council in 2004. Among other things, it criticized the lack of collaboration between the CEC and the appropriate trade bodies under the NAFTA Free Trade Commission (as mandated by NAAEC Article 10(6)). To increase the capacity of the three countries to identify and address trade-related environmental concerns, to reinvigorate the relationship between the CEC and the Free Trade Commission, and to bring more focus to the CEC work, the Parties revitalized the Article 10(6) Working Group and developed a strategic plan on trade and environment.

This working group is now taking an active role in the implementation of the CEC's trade and environment work in order to facilitate the development of mutually supportive trade, economic and environment policies to mitigate problems identified in environmental reviews and enhance environmental benefits of those policies. This renewed interest of trade officials in the CEC's work is reflected in the participation of the Office of the US Trade Representative and International Trade Canada in the advisory group for the third symposium. It is also reflected in the partnership of International Trade Canada and Foreign Affairs Canada with the CEC to host a public consultation on Canada's environmental assessments of foreign investment promotion and protection agreements. Hosting the public consultation immediately following the symposium favored the participation of a public better informed about the important trade and environment issues.

These biennial trade/environment assessment symposia constitute a significant step in fulfilling CEC's mandate to monitor the environmental effects of NAFTA on an ongoing basis. This public discourse and analysis makes NAFTA unique among trade agreements, a strength completely in keeping with the public participatory and transparency focus of the NAAEC and of the CEC, in its role as a clearinghouse for information and a meeting place for people interested in the environmental effects of free trade.

In conclusion, in addition to the Council, we would like to thank International Trade and Foreign Affairs Canada and Hydro-Quebec for their financial support of the third symposium.

Chantal Line Carpentier
Head, CEC Environment, Economy and Trade program

ADDRESS BY WILLIAM V. KENNEDY, CEC EXECUTIVE DIRECTOR

Bonjour, Buenos Días, Good Morning! It is my pleasure to welcome you to the third North American Symposium on Assessing the Environmental Effects of Trade.

In the few moments available to me this morning, I would like to put this event into a larger context and underline the importance of your contribution over the next two days to the work of the Commission for Environmental Cooperation.

As I expect most of you will know, the North American Agreement on Environmental Cooperation, or NAAEC, is in many respects, an important caveat to the 1994 North American Free Trade Agreement. And just as NAFTA is recognized (at least in trade circles) for its own environmental provisions, the NAAEC and the Commission established to support its provisions—the CEC—represent at the broadest level an equally famous commitment on the part of Canada, Mexico, and the United States that free trade and its attendant changes—in trading patterns, in capital flow, in private investment, in production and transportation—that none of this ought to occur at the expense of our environment. That's a grand promise. We have just passed our tenth anniversary as partners in NAFTA and there is no shortage of analysis on how well we are doing, both in terms of the North American environment itself, as well as the manner in which our three countries continue to pursue the lofty objects of the NAAEC. This, of course, is no simple matter. Indeed, it brings us to today.

Today and tomorrow, we will explore two main questions. The first is: what are the environmental impacts of investment disciplines in trade agreements, such as NAFTA's Chapter 11, or of investment agreements on their own, such as the Canadian Foreign Investment Promotion and Protection Agreements (that our partners from International Trade will present at lunch today and consult on tomorrow)?

The second question before you is: have environmental pressures in North America been decoupled from economic growth? Put another way, are environmental impacts growing at the same rate, a lesser rate, or a greater rate than our GDPs? Not only will we examine the empirical evidence on this relationship but also session 1B this morning will explore the market-based drivers that lead to a disassociation between economic growth and environmental impacts. Canada, Mexico and the United States deserve our thanks for supporting our work to develop the analytical framework for assessing the environmental impacts of trade, and for supporting the public in documenting and presenting in these fora the environmental effects of the NAFTA. The CEC process is not the last word on how to assess environmental effects of trade. But it is, I believe, a welcome catalyst in shifting from debating methods and hypotheses to supporting civil society in actually undertaking such assessments. I particularly want to thank International Trade Canada for recognizing the importance of this event to educate and consult the public on the complex relationship between trade and investment agreements and the environment.

I mentioned earlier that both the NAFTA and the CEC had recently passed their tenth anniversary. In looking at our original goals it was noted that we had failed to accomplish high-level collaboration among the continent's top trade and environment officials. An independent review of our first decade concluded: "[a] decade after negotiating the NAAEC…the Parties still pursue their trade and environment policies largely separately rather than through the CEC. One of the results of this is that they are not always in a position to anticipate—and thus to prevent—environmental problems associated with increased trade and economic development." I am pleased to note that this symposium, in a sense, marks a new era of collaboration between our countries' trade and environment officials. Trade representatives from the United States

and Canada were on our advisory group (see CD for a list of advisory group members), a first step in the reinvigorated the relationship between the CEC, the environment and trade officials.

It must also be noted that the CEC Council—the top environmental officials of each of our three countries—agreed last year to develop a strategic plan on trade and environment. This strategic plan, which you will find in your delegate package, addresses a major criticism we previously received from the public concerning our assessment work. We believe the plan will help to establish a better working relationship between the CEC and the Free Trade Commission and will raise awareness among officials of the trade and environment work undertaken by the Commission and the NAAEC. None of us will be unaware of the fact that, as we meet, just a few blocks from here tens of thousands of people are gathered to witness the discussion of the Parties to the Kyoto Protocol to the United Nations Framework Convention on Climate Change. I'm not sure what that says about us—personally I think it remarkable that there are more than 200 registered for this event, given the competition.

More seriously, however, I would point out that, as certain as the final communiqué, will be the street demonstrations and counter-events at which the claim will be that governments are not listening. And in this respect I must point out another of the unique features of the NAAEC. This is an agreement that puts transparency and public engagement at the heart of its operations. To that end, many of you participated in a public meeting yesterday hosted by the CEC's Joint Public Advisory Committee. JPAC s responsibility is to advise our Council and inform the Secretariat on all matters within the scope of the NAAEC. And, to carry out their mandate, among other things, they host public meetings such as that of yesterday. JPAC provides a direct conduit to the public enhancing both the transparency and accountability of our organization.

I cannot conclude without taking this opportunity to thank each of the authors in advance for your commitment and hard work. Your efforts, and this meeting, mark another step forward in moving the trade-environment debate from the theoretical to a more empirically-based debate. Let me also thank the session chairs and the discussants for taking time from your busy schedules to contribute to this public event. Allow me one other expression of thanks, to this symposium's advisory group. You will encounter them throughout the event as session chairs, presenters and discussants. You can find each of their names and affiliations in your binder. They are seated in the front row here and I would like them to stand so we might all give them a hand of applause for sharing (*pro bono*) their time and expertise. The advisory group selected and reviewed the papers to be presented to you at this event. And I have no doubt, when looking at the list of participants here today, that these papers will only improve over the next two days thanks to your comments and questions.

Ladies and gentlemen, one lesson we must never forget is the best policy, whether environmental or trade-related, needs in its development to be transparent and to engage civil society in a meaningful way. To this end, this third symposium—the first ever in Canada—already represents a remarkable achievement. The content and value stems not from governments, or the CEC, but from you. This is your meeting.

Let me conclude by thanking our colleagues from Hydro-Quebec, who are sponsoring this evening's reception, at which we will have the pleasure of hearing from Quebec's minister of the environment, M. Thomas Mulcair. We are proud of Hydro-Quebec's support and of the increasing engagement of the private sector in our work.

A BRIEF NOTE ON THE CONTENTS OF THIS REPORT

These proceedings present a summary of the symposium sessions as contributed by discussants and rapporteurs, along with the executive summaries of the papers presented in each session. The full texts of the papers in their original languages are available on the CD-ROM as well as any PowerPoint presentations used in the presentations. Other material, such as the agenda, the list of participants, the JPAC chair address, the original call for papers, the members of the advisory group, etc., can also be found on the CD or on the CEC web page at ⁘cec.org/symposium⁘.

CD-ROM contents

- **symposium agenda**
- **list of participants**
- **call for papers**
- **members of the advisory group**
- **JPAC chair address**
- **Trade and Environment strategic plan**
- **annotated trade and environment bibliographies**
- **papers presented at the symposium, in their original language**
- **PowerPoint presentations presented at the symposium**
- **JPAC public session proceedings**
- **International Trade and Foreign Affair Canada's workshop material**
  - **agenda**
  - **list of participants**
  - **presentation**
  - **proceedings**

SYMPOSIUM SESSIONS

SESSION 1A: **ECONOMIC GROWTH AND THE ENVIRONMENT IN NORTH AMERICA, PRE- AND POST-NAFTA**

■ **Introduction: Economic Growth Before and Since NAFTA**
Scott Vaughan, Director, Unit for Sustainable Development and Environment, Organization of American States

■ **The Effect of NAFTA on Energy and Environmental Efficiency in Mexico**
David Stern, Professor, Rensselaer Polytechnic Institute

■ **"Push" and "Pull" Impacts of NAFTA on Environmental Responsiveness and Performance in Mexican Industry**
Priscilla Wisner, Professor, Montana State University
Marc Esptein, Professor, Rice University

■ **Scale, Technique and Composition Effect in the Mexican Agricultural Sector: The Influence of NAFTA and the Institutional Environment**
Silvina J. Vilas-Ghiso, Research Assistant, Environmental Change Institute, University of Oxford
Diana M. Liverman, Director, Environmental Change Institute, Oxford University

DISCUSSANT: Arik Levinson, Professor, Georgetown University
RAPPORTEUR: Scott Vaughan

■ Introduction: Economic Growth Before and Since NAFTA

Scott Vaughan

- **Mexico's exports to the United States and Canada more than doubled, in dollar terms, between 1993 and 2002.**
- **Mexico's trade (the sum of exports and imports) with its NAFTA partners rose from 25 percent of its GDP in 1993 to 51 percent in 2000.**
- **While growth in trade has slowed since 2000, Mexico's trade with NAFTA partners still accounts for more than 38 percent of its GDP (2002).**

Depending on some estimates, NAFTA is responsible for between 3 and 50 percent of the increase in US imports from Mexico after 1993 and the accelerated pace of diversification (from agriculture to manufacturing to services). Others find that 1986 tariff reductions related to GATT membership, as well as 1994 peso crisis better explained changes following NAFTA.

The Effect of NAFTA on Energy and Environmental Efficiency in Mexico

David I. Stern

Prior to Mexico's entry into the NAFTA, predictions of the consequent impact on the environment in that country ranged from the dire to the very optimistic. This paper investigates NAFTA's outcomes in terms of energy use and the emission of atmospheric pollutants in the three countries. Empirical questions include:

- **Has entry into NAFTA led to a convergence or divergence in indicators of emissions, environmental efficiency, and emissions specific technology in Mexico, the United States, and Canada?**
- **Has NAFTA caused a structural break—in rate of change—in the trend of the various indicators?**

The methodology used for this analysis has three stages: computation of the various indicators of environmental efficiency, convergence analysis using the computed trends, and tests for structural breaks in the series.

Four parameters are considered—energy, and atmospheric emissions of carbon, sulfur and NO_x—to construct two different types of indicators: emissions or energy-use intensity (divided by GDP) to measure the composition and technique effect on environmental quality, and energy or emissions efficiency (divided by country population) to measure scale (due to the increase in economic activity), composition (due to trade specialization, holding aggregate output constant), and technique effects (due to changes in the mix of inputs and technological change). Two other indicators used are the state of technology in sulfur abatement and energy efficiency. The methodology does not identify which changes are due to NAFTA and which are not, but it allows us to determine whether environmental quality and environmental efficiency have improved at a faster rate in Mexico since NAFTA came into effect, and whether Mexico has been converging with the United States and Canada to a greater degree since that time than before.

The results show that neither extreme prediction of the outcomes of NAFTA has materialized. Rather, trends that were already present before the introduction of NAFTA continue and in some cases have improved since that time, but not yet in a dramatic way. There is strong evidence of convergence for all four intensity indicators across the three countries towards a lower intensity level. Though intensity rose initially in some cases in Mexico, it eventually began to fall after NAFTA came into effect. Per capita measures for sulfur and NO_x emissions also show convergence, but this is not the case for energy and carbon emissions. In addition, energy and carbon emissions per capita are drifting moderately upwards. The state of technology in energy efficiency and sulfur abatement is improving in all countries, though there is little, if any, sign of convergence and NAFTA has no effect on the rate of technology diffusion. Total energy use and carbon emissions have increased both before and after NAFTA came into effect and total NO_x emissions have increased in Mexico. Only total sulfur emissions are falling in all three NAFTA partners. No obvious structural break in the data occurred in 1994. In conclusion, energy and carbon and sulfur emission intensity (per GDP) is decreasing in all three countries, NO_x emission intensity is decreasing in Canada and the United States but increasing in Mexico; per capita levels of sulfur emissions are decreasing while energy and carbon emissions per capita are increasing in all three countries; and NO_x emissions per capita are increasing in Mexico, though more recently it has seemed to start on a downward trend. While there is no strong evidence from this analysis that NAFTA has improved environmental outcomes in Mexico, there certainly is no evidence that it has made things worse and it may be associated with improvement in the United States. According to these results, Mexico's technology is improving at a slower rate than that of its two northern neighbors. Negative environmental change has been led by increased population, which cannot be directly blamed on NAFTA.

■ "Push" and "Pull" Impacts of NAFTA on Environmental Responsiveness and Performance in Mexican Industry

Priscilla S. Wisner and Marc J. Epstein

The purpose of this study was to conceptually and empirically link NAFTA to manufacturing facility practices in Mexican industry that would impact environmental performance. Two of the impacts of the NAFTA negotiations were increased pressure on Mexican authorities to strengthen environmental regulations and enforcement, and the expansion of trading opportunities between Mexican, Canadian, and US companies. One would expect that increased regulatory pressures would "push" companies to improve industrial performance—the "Porter effect hypothesis." Implicit in this hypothesis is that firms take actions and employ resources when the benefits of doing so outweigh the costs of the actions. Facilities that face strong regulatory pressures are more likely to self-regulate their own operations, because the costs of poor environmental performance include additional inspections, penalties, and even closure of plants if they do not comply with regulatory standards. Additionally, they may also benefit by reducing waste and other environmental costs in the organization. However, firms may also be "pulled" toward better environmental performance through pressures and expectations placed by trading partners. Hypotheses tested include:

- **Firms that perceive the strongest regulatory pressures will take more environmental management actions, while firms that perceive lesser degrees of pressure will take fewer actions.**
- **Mexican facilities that export to US and Canadian customers are expected to be more environmentally responsive than those facilities only selling their products within Mexico.**
- **The best performing facilities will be the ones that have more comprehensive environmental management plans, and that the worst performing facilities do the poorest job in terms of planning.**

These hypotheses were tested using data from 221 Mexican manufacturing sites selected in 1995 from four industry groups that were estimated to account for 75 percent to 95 percent of Mexico's total industrial pollution; they were located in Mexico's main industrial corridors. The distribution of the sample by industry sector was as follows: food (27 percent), chemicals (26 percent), non-metallic minerals (21 percent), and metals (26 percent). Large facilities with over 250 employees accounted for 29 percent of the sample; small facilities with less than 100 employees accounted for 39 percent.

Tests of the first two hypotheses provide evidence that both the "push" effect of regulatory influence and the "pull" effect of market pressures were significantly associated with industrial environmental responsiveness. The implementation of NAFTA spurred the Mexican government to strengthen environmental regulation by creating stronger oversight agencies, implementing more regulations, and more consistently enforcing environmental regulations. A stronger regulatory environment puts pressure on or pushes companies to conform to the laws, or face the risks of penalties, fines, and potentially closure of the firms. But, market pressures are empirically demonstrated to exert more relative influence than regulatory pressures, and market pressures resulted in a stronger environmental management responsiveness. Therefore, customer pressure is a more effective impetus for managing industrial environmental performance, then regulation, when those customers are located in countries with stronger environmental standards and cultures. By creating additional exporting opportunities, NAFTA created a "pull" effect on Mexican businesses to be more environmentally responsive. Mexican firms wanting to sell to customers in the United States and Canada, countries that have stronger environmental cultures, would need to be more sensitive to the demands of these customers. The paper, therefore, conceptually and empirically demonstrates a link between NAFTA and improved environmental performance in Mexican industry. These findings support the growing movement to green the supply chain.

Testing of the third hypothesis confirms that the degree of environmental responsiveness within the firms is positively and significantly associated with environmental performance outcomes.

Scale, Technique and Composition Effects in the Mexican Agricultural Sector: The Influence of NAFTA and the Institutional Environment

Silvina J. Vilas-Ghiso, Diana M. Liverman

Eleven years after NAFTA entered into force, the environmental effects of agricultural trade liberalization in Mexico are still controversial, emerging and not properly understood. This paper contributes to the small but growing literature that aims to explore trends in input use in the agricultural sector in Mexico during the NAFTA period since NAFTA came into effect, among both industrialized and communal farmers, as well as the influence of the national and multilateral institutional framework on these outcomes.

To estimate the impact of trade liberalization, in this paper we break down agricultural production data derived since NAFTA came into effect into the three ways economic growth and trade affects the environment—scale, technique and composition effects. In agriculture, the composition effect is measured in terms of crop selection, for instance, grains versus horticultural plant production. The effect of farming technique is measured here in terms of fertilizer use, for which reliable aggregate data are available. Conclusions are drawn for industrial farming enterprises—large agro-enterprises located in northern Mexico, which are export-oriented, rely on input-intensive agricultural methods, and are mostly located on irrigated land—and communal (ejido) farmers (small producers located more in southern Mexico who work rainfed lots with generally poorer soils). Among industrial farmers, the patterns of crop specialization favoring horticultural plant production and significant technological improvements seem to have driven fertilizer use down, although this decrease is not sufficient to offset the increases resulting from growth in agricultural output—the scale effect. Among communal farmers, increased output and specialization on land-extensive grain crops are both contributing to an increase in the amount of land under cultivation. Technological improvements have the potential to offset the scale and composition effects but remain too small to do so; thus, the overall environmental impacts increase.

Our analyses of the environmental institutional framework and rural development plans show that institutional weaknesses have, in some instances, reduced the positive technique and composition effects, i.e., there is a trend toward increased use of fertilizer, pesticides, and irrigation. Better coordination and enforcement of the existing pesticide, fertilizer and toxic substances laws and regulations could limit their use.

Reactions of Arik Levinson, Discussant for Session 1A

To assess the relationships between growth and the environment prior to and since NAFTA came into effect, the three papers in this session look, in order, at energy use and environmental efficiency across the NAFTA countries, the push (regulatory) and pull (market-driven) effects, and scale, composition, and technique effects in the Mexican agriculture sector. They are all legitimate ways to look at the problem and I would like to add another way to look at it.

Economic growth affects the environment in three ways: (1) scale, (2) composition, and (3) technique effect. Because NAFTA's most direct effect is the composition effect, I suggest that we:

1. Sort industries by pollution intensity.
2. Examine US-Mexico-Canada trade patterns to see if the range of Mexican exports has become more polluting.

Rapporteur for Session 1A: Scott Vaughan

This session comprised three very interesting and complementary papers by David Stern, Priscilla Wisner and Silvina Vilas-Ghiso, and a commentary by Arik Levinson that nicely pulled the papers together. I will not summarize the papers or commentary, but will highlight three issues that arose from them and the discussions:

- **The issue of data coverage and reliability;**
- **Identifying drivers of environmental change, and differentiating correlations from causality; and**
- **Methodological issues, particularly how to disentangle scale from compositional and technology effects raised in the Vilas-Ghiso agricultural paper.**

Let me begin with the question of data, which has been a recurring theme throughout several sessions yesterday and today. Clearly, reliable and robust data are pivotal in understanding changes underway and in ensuring regulatory compliance. Symposium participants have noted that amassing data is costly but critical to sound policy. They have also highlighted several problems and concerns regarding data, including:

- **The World Bank Industrial Pollution Projection System data sets are still used by many researchers, but they are almost a decade old and raise questions of applicability.**
- **Several speakers noted the growing body of data based on surveys and questionnaires. However, questions about the reliability and comparability of self-reporting data were raised. In addition, due to confidentiality considerations in self-reported data, most data sets do not identify firm size.**
- **Concern was raised about the level of data aggregation. For example, national reporting misses environmental problems at the local level: the high incidence of children's asthma in Mexico might be cited as an example.**
- **There are concerns about specific data sets, including the 2002 poverty indices for Mexico of the Economic Commission for Latin America and the Caribbean and the World Bank, and applicability of the Food and Agriculture Organization national fertilizer application data to assess compositional changes in farm output.**

I would make two suggestions: first, that through the CEC, national environmental ministries improve the focus, comparability and reliability of environmental data. Second, that the CEC become a data portal. Very interesting progress has been made within the CEC work program in using data from other programs—including data on toxics from the pollutant release and transfer register program, data from the sound management of chemicals, and indicators of children's health—to assess trade-environment linkages, but the full potential of using these data has not been explored.

The second large issue is that of correlations in environmental performance among the three countries, as opposed to NAFTA-related causality. As Arik Levinson noted in his comments, David Stern's paper shows several areas of convergence in air quality indices among Canada, Mexico and the United States. However, Stern notes that due to numerous drivers of change, the specific impacts of NAFTA are ambiguous. Causality of NAFTA cannot be established.

By contrast, Wisner's paper looked at the relative importance of the regulatory-related push factor in affecting environmental performance at the firm level, compared to market and NAFTA-based pull factors. She noted in her paper, as well as in discussions with others, that industrial supply-chains, business-to-business linkages, the influence of life-cycle design and corporate social responsibility, are all important influences on environmental performance. The question that remains is how NAFTA has affected these management systems, and what would have happened in the absence of NAFTA?

The third issue is methodological. The Vilas-Ghiso paper examined what is recognized in the discussions as a critical sector in Mexico: agriculture. Important changes are underway in land use, farmers are shifting from rain-fed to irrigated agriculture, and fertilizer and pesticide inputs are increasing. It was suggested in the discussion that analyses also consider organic production.

Levinson has proposed what I think is a very interesting and pragmatic approach to looking at the question of compositional changes:

1. We might look at pollution intensity per unit of output, or dollar value. The important thing is to set out a relative ranking between industries. For this, researchers can use the World Bank's 1994 data sets, or other data.

2. Based on relative ranking, we might look at changes in Mexican exports to the United States, as well as to Canada, and multiply export levels, industry-by-industry, times their ranking within the industry.

3. The result is a time series of predicted pollution intensity in Mexico, based on exports. This can help tease out compositional effects of exports, without taking into account changes in technological innovation and pollution abatement measures.

4. This is obviously stylized, for if predicted pollution grows more than exports, then it suggests that a compositional shift has entailed the establishment of dirty industries coming from the United States and Canada to Mexico. If the opposite trend occurs, then it suggests a shift in Mexico towards cleaner production. Although the details of this approach remain to be developed (see also Claudia Schatan's new book—the full reference for which can be found in Session 2A), the suggestion of a data portal could be very useful for the CEC in this exercise.

One final comment: I would make an additional suggestion that the CEC's studies of renewable energy be complemented by work in non-renewable energy, including looking at fiscal and other incentives applied within that sector.

SESSION 1B: **MARKET-BASED DRIVERS FOR SUSTAINABLE GROWTH**

■ **Industry Perspective**
Daniel Gagnier, Senior Vice President, Alcan

■ **Nongovernmental Organization Perspective**
Ken Ogilvie, Executive Director, Pollution Probe

■ **Government Perspective**
Mike Wilson, Director General, Partnerships and Consultations, Environment Canada

Rapporteur: *Lilia Domínguez-Villalobos*,
Professor, Universidad Nacional Autónoma de México

This session, chaired by Mark Linscott, Assistant for Environment and Natural Resources, US Trade Representative, is not, like the others, based on proposals submitted in response to the call for papers. No papers were prepared for this session, as the goal was to have an interaction between the various actors on the drivers of sustainable growth. PowerPoint documents are available for the presentations of Daniel Gagnier and Ken Ogilvie.

■ Reactions of Lilia Domínguez-Villalobos, Rapporteur for Session 1B[1]

I am summarizing the main points of discussion raised in relation to market-based drivers for sustainable growth, from the point of view of agents: firms, governments and nongovernmental organizations (NGOs). The three presentations show that there is a great scope for cooperation on environmental issues.

The industry view, presented by Daniel Gagnier, illustrates that firms can do a lot for the environment if they integrate the goal of environmental preservation into their corporate strategy. Alcan has defined eight mega-issues related to the environment that will affect the firm in the short and long run, like climate change and energy, pollution and health, or the energy crunch. Alcan's approach is to address these issues with social responsibility and sound liability-risk management. The main point from the business side is that sustainable development implies energy efficiency, social responsibility, transparency and accountability, but it must be compatible with the generation of revenues. Although in the short term it may hurt competitiveness, to do things right now gives an important benefit for the firm in the longer term.

The work of Pollution Probe typifies the large range of NGO activities for promoting sustainable development. This NGO has been very active on several issues, among which climate change, water, energy, toxics and environmental management have been mentioned. It participates in policy processes, performs studies, educates and informs the public, and forms strategic alliances with other NGOs to strengthen support for specific policies. The presentation centered on Pollution Probe's role in the policy discussions around Canada's commitment to the Kyoto Protocol. On the issue of emission trading, it has intensively participated in the policy process leading to the development of the Ontario Emissions Trading System, it prepared a report on hot spots in emissions trading, and participated in discussions led by Environment Canada on the potential for cross-border emissions trading.

[1] Note that, given the election of a new federal government in January 2006, there will likely be a number of changes to the overall program and policy mix in Canada for addressing climate change.

The great need for transparency, easy access to key documents on credit creation, and emissions trading, as well as accountability, have all been stressed. But NGOs also play an important role in pointing out the problems and deviations from the goal of sustainability. Pollution Probe, for instance, finds problems in Canada's emissions trading program. The Large Final Emitters (LFEs) target is too weak—representing only 55 percent of the 270 million tonne reduction mandated by 2010 under Canada's Kyoto commitment. The question is, who shoulders the 100 million tonne burden lifted from the shoulders of the LFEs. The fact that a price ceiling of $15 per ton has been set is a mistake that will spoil the market. The view of the government was presented by Mike Wilson. He expressed the opinion that recognizing business realities when developing environmental policy and recognizing environmental realities when making business decisions are the keys for successful outcome to the Corporate Environmental Innovation program.

Environment Canada has traditionally focused on directly influencing corporate behavior through regulation, industry programs and agreements. There are also indirect ways of ensuring that capital markets assist in improving environment performance. These include measures to change market rules, alter property rights or factor in pricing externalities. But Mike Wilson maintains that much can be done within existing rules by helping firms realize that it is in their interest to disclose information, to understand the significance of environmental performance and management, and to analyze relevant information.

Some of the ways that Environment Canada has been playing this role include:

1. Creation and coordination of an informal network composed of experts from industry, government, banks and nonprofit organizations, linking environmental performance to business financial value (in collaboration with the CEC).
2. Support increased transparency and disclosure of corporate environment performance information so that markets can respond effectively to investment risks and opportunities.

Ensuing discussions related to the two separate issues: (1) the Canadian approach to reach the Kyoto Protocol and (2) the need to provide mechanisms for the possible failure to comply with NAFTA. On the first issue, the price ceiling advantages and disadvantages were discussed, as well as the role of the provinces and of federal aid to them. On the second issue, the possibility of a follow-up mechanism to Article 14 and 15 was suggested as a way of ensuring that the Parties act on CEC factual records responding to allegations of failure to enforce environmental laws in North America.

Working Lunch: Environmental Assessments of Foreign Investment Promotion and Protection Agreements

Stephen de Boer

International Trade Canada (ITCan) and Foreign Affairs Canada (FAC) organized a workshop and public consultation on Environmental Assessments of Foreign Investment Promotion and Protection Agreements (FIPAs) on December 1, held in conjunction with the symposium. The first session involved a short presentation by ITCan on Canada's FIPA Program, the government's approach to environmental assessments of foreign investment promotion and protection agreements and the current work underway to conduct environmental assessments of such agreements between Canada and Peru, Canada and India and Canada and China. The second session will involve small group discussions focusing on specific questions related to the topic. Symposium participants were invited to participate and give constructive feedback as interested stakeholders and experts on the environmental impacts of investment that will serve to inform the future work by ITCan and Foreign Affairs Canada in this area. The questions discussed and recommendations received during that December 1 session are presented on the CD-ROM.

SESSION 2A: **HAVE POLICIES LED TO IMPROVED ENVIRONMENTAL PERFORMANCE BY FOREIGN INVESTORS?**

■ **Introduction: Investment in North America, Before or Since NAFTA**
Aaron Cosbey, Associate and Senior Advisor,
International Institute for Sustainable Development

■ **The Maquiladora Electronics Industry and the Environment Along Mexico's Northern Border**
Claudia Schatan, Head, Industrial Development Unit, Economic Commission for Latin America and the Caribbean
Liliana Castilleja, Asistente de Investigación, Industrial Development Unit, Economic Commission for Latin America and the Caribbean

■ **Learning Processes in the Maquiladora Export Industry and Environmental Technologies in Three Northern Border Cities in Mexico: Tijuana, Mexicali and Ciudad Juárez**
María del Rosio Barajas E., Coordinator, El Colegio de la Frontera Norte
Carmen Rodríguez C., independant researcher
Humberto García J., Professor, Universidad Cristóbal Colón

■ **NAFTA and the Mexican Automobile Industry: The Road towards Harmonization of Environmental Standards in North America**
Isabel Studer Noguez, Research Director, North American Commission for Labor Cooperation

Discussant / Rapporteur: *Kevin Gallagher*, Professor, Boston University

■ Introduction: Investment in North America, Before and Since NAFTA

Aaron Cosbey

Foreign direct investment (FDI) in Canada, Mexico and the United States has increased in the three NAFTA countries. FDI from the United States represents the majority of FDI in Mexico, while Canada still represents a small share of total FDI in Mexico. The question is whether NAFTA has increased FDI flows? Theory tells us there are two kinds of investment: (1) horizontal, implying "jumping" tariff or other barriers to produce for local/regional market, and (2) vertical, implying a search for efficiency—drawn to host countries with different comparative advantages. In the case of North-North, or South-South agreements, the FDI effects should be minimal. In the case of North-South agreements (including NAFTA), horizontal investments should decrease in the southern partner. In fact—the evidence is inconclusive—there is some indication that NAFTA has increased FDI flows. For the two benefits associated with FDI, spillover and growth effects, the evidence is mixed. For growth effects, the country-specifics matter.

The Maquiladora Electronics Industry and the Environment along Mexico's Northern Border[2]

Claudia Schatan and Liliana Castilleja

This paper focuses on the environmental problems in the electronics assembly (maquiladora) industry along the northern Mexican border. It analyzes the legal and institutional regulatory framework to protect the environment, both at the local and the international level, as well as environmental policy at the firm level in Mexico (specifically in three Mexican cities, Ciudad Juárez, Mexicali and Tijuana). We find that, although it has improved, environmental management in the electronics assembly industry in northern Mexico is still embryonic. This conclusion is borne out by the finding that of 200 enterprises—a representative sample of electronic maquiladoras along Mexico's northern border—almost half admitted not having implemented active environmental measures. This leads us to conclude that there may be important opportunities in international markets for this industry if its benchmark for environmental standards were to be based on significant technological innovation and the new environmental standards worldwide rather than on local regulations and standards. Multinational corporations in the area, with some exceptions, do not incorporate environmental technological improvements in all their plants and, if they do, this is done is more in accordance with local requirements than as a transfer of technology from headquarters. A more strategic vision that better links industrial and environmental policies may yield improved competitive advantages to this industry (an especially important one for a developing country such as Mexico) than has been the case up to now.

Learning Processes in the Maquiladora Export Industry and Environmental Technologies in Three Northern Border Cities in Mexico: Tijuana, Mexicali and Ciudad Juárez

María del Rosio Barajas E., Carmen Rodríguez C., Humberto García J.

(Paper available in Spanish only)

In this research, we analyze the environmental performance of foreign companies operating under the maquiladora regime in Mexico. Specifically, we look at maquiladoras' environmental performance associated with the evolution of their production over the last several years. Using levels of technical-production complexity, we analyzed differences in maquiladoras' environmental performance, while identifying those variables associated with environmental behavior. We also explored the cooperative relationships existing among government institutions, nongovernmental organizations, maquiladoras and various environmental protection bodies. We found that compliance is the main cause for undertaking environmental protection actions; this behavior is differentiated by technical-production level:

1) Companies at the basic level of technological development brought about environmental technologies and measures under pressure from the Federal Attorney for Environmental Protection (*Procuraduría Federal de Protección al Ambiente—Profepa*), since companies with lower technical-productive development are less motivated to invest in environmental measures than more developed plants. Companies at the intermediate-basic and advanced levels engage in compliance because the parent company requires environmental certification.

2) More than half of companies at the basic and intermediate-advanced levels increased their environmental spending, although such spending is small compared to their overall operating expenses. Nearly two-thirds of plants at all four levels chose on their own to invest in environmental protection.

3) Maquiladoras' principal environmental problems are linked to the confinement and reexport of toxic substances and industrial waste, and trash removal. In companies at basic

[2] This paper is an updated and improved version of Chapter 3 in El Medio Ambiente y la Maquila en México: Un Problema Ineludible. 2005. Eds. J. Carrillo and C. Schatan. México, D.F.: CEPAL.

and intermediate technical-production levels, the reduction of toxic materials and emissions are the leading positive effect of environmental compliance.

4) Another approach to the relationship between governmental authorities and maquiladoras is the application of the Voluntary Environmental Compliance Program (*Programa de Autogestión Ambiental Voluntaria*) promoted by the federal government.

5) We also found a distinct heterogeneity among plants with regard to the emphasis they place on their environmental budgets: a) plants having an environmental department but with a low proportion of environmental protection staff and spending; b) plants with an environmental department and a greater proportion of environmental staff and spending than the preceding group, as well as ISO 14001-certification; and c) companies featuring a quantitative and qualitative improvement over the previous two groups, which, besides allocating proportionally high levels of human and economic resources with respect to all resources, are also certified under ISO 14002.

■ NAFTA and the Mexican Automobile Industry: the Road Towards Harmonization of Environmental Standards in North America

María Isabel Studer Noguez *(Paper available in Spanish only)*

In late 2005 and early 2006, respectively, Mexico adopted stricter sulfur standards for fossil fuels and standards to control and regulate emissions for new engines manufactured and distributed in Mexico. With these new rules, Mexico took an important step towards harmonizing environmental standards with the United States and Canada.

The adoption of these standards came after a long negotiation process between different agencies of the Mexican federal government and the automotive industry. In this paper, I explain the automotive industry's position on these new environmental standards, based on an analysis of the economic incentives generating increased integration in automobile production between Mexico and the United States, to adopt comparable environmental standards on both sides of the border.

This case study is particularly important because it shows how free trade, in this case the North American Free Trade Agreement (NAFTA), is positively related to the adoption of higher environmental standards in Mexico. The evidence in this study does not support, at least in the case of the automotive industry, one of the hypotheses most discussed during the NAFTA negotiations, namely that the economic competition caused by liberalized trade with Mexico—a country with a limited environmental enforcement capacity—would reduce US and Canadian environmental standards to the lowest common denominator. The particular case of the North American automotive industry proves that the growing integration of production on a transnational basis, possible thanks to trade liberalization, leads to economic incentives to adopt the highest environmental standards in the region.

I show that the decision to introduce stricter emissions standards in Mexico is based on economic dynamics linked to trade liberalization, favoring the preferences of segments within the Mexican government—particularly Semarnat—to raise such standards. I offer a detailed quantitative analysis of production, trade and investment in the automotive sector, describing how the industry has integrated the North American production system over the last two decades. I also provide a detailed review of environmental regulations with regard to air quality. The comparison with Canada also shows that Mexico is not an isolated case, but rather is part of a broad process to internationalize production, open markets and intensify competition globally. In other words, the document shows that the harmonization of environmental standards has an economic reason linked with the process of economic globalization.

Reactions of Kevin P. Gallagher, Discussant and Rapporteur for Session 2A

Some policy makers have cited the weak evidence found thus far in the literature on pollution havens to argue that nations need not be concerned about the environmental effects of trade. Rather than present yet another series of studies on whether environmental regulations make firms move to Mexico—the pollution haven hypothesis—the researchers in this session ask the question: what is the behavior of foreign firms when they come to Mexico—regardless of whether they come for environmental reasons or not? By going beyond the pollution haven hypothesis, these papers find that there are both positive and negative impacts of foreign direct investment on the environment.

The specific questions asked are: (1) do multinational corporations transfer cleaner technology and better environmental management systems; (2) do multinational corporations require better standards of local suppliers; and (3) do connections with external markets (in the form of exports and imports) give incentives for firms to improve their environmental performance? The answers to these questions are mixed.

The authors used creative approaches in terms of data gathering and methodology to alleviate some of the limitations in performing this type of research. They make creative use of existing data, which are usually unknown to non-Mexican researchers and governments. For instance, Schatan's industrial survey was done in a sufficiently rigorous manner to enable econometric analysis by herself and Barajas, et al.

In terms of clean technology transfer, some firms (a little more than half) were found to bring in environmental management systems. It is not clear whether this is in response to environmental standards or a goal to improve a firm's environmental performance. In terms of the impact on suppliers, little contact with local suppliers was found and when a linkage did exist, impacts on the environmental management system and environmental performance were increasingly weaker as one moved down the supply chain. In terms of the effect of an export market with higher standards (the pull effect), it proved to be strong in the auto industry, even including foreign auto firms lobbying for tighter auto emissions standards in Mexico. In the electronics sector, however, US market policies provide poor incentives relative to those of the European Union, and have little impact on environmental performance. Finally, domestic markets and regulation in Mexico were found to provide few incentives for sustainable production and consumption by foreign firms.

It can be concluded that foreign direct investment does not automatically lead to clean technology transfer, greening the supply chain, or upward harmonization toward global standards. Active policies are thus necessary to provide the proper incentives for firms to incorporate environmental protection into their actions.

Ensuing discussions focused on questions regarding the reasons for focusing on the electronics and automobile industry, the effects on workers in these foreign plants, and on a few cautions and suggestions. The authors justified the study of their sector by pointing out that, combined, these sectors form the bulk of export activity and FDI flows in the Mexican economy. However, they acknowledged that research in other sectors is needed. In addition, there are large opportunities for forward and backward linkages in these sectors, although these opportunities have not always been realized. The issue of lead and other pollutants in the electronics industry was acknowledged to be essentially a worker-related issue, given workers' exposure to these chemicals. Technologies and processes exist for cleaner production in this sector but they are not being used in Mexico yet. Data limitations make measurement difficult, but according to UNCTAD's World Investment Report, Mergers and Acquisitions amounted to more than 50 percent of all FDI flows in the 1990s. It was recommended that they get parsed out to get a better picture of FDI flows in Mexico.

I would like to offer a few suggestions that came to mind following this session. When it was created, the CEC missed an opportunity to compile and gather the necessary data that could have provided baselines and help us continually evaluate the environmental impacts of trade in a more rigorous manner. To rectify that missed opportunity, the CEC's Trade and Environment program should undertake an exhaustive survey of the available data from the NAFTA countries that could be used for trade and environment analysis. Subsequent to such an effort, the CEC should identify the data gaps and work with necessary government officials in the NAFTA countries. The lessons extend to other trade agreements, as the US government is in the process of deciding the extent to which it will be setting up environment programs connected to its trade agreements in the Americas.

SESSION 2B: **TRANSFER OF CLEAN TECHNOLOGY AND BUSINESS PRACTICES**

■ **Business Environmental Decisions in the Context of the Free Trade Agreement**
Lilia Domínguez-Villalobos, Professor, Universidad Nacional Autónoma de México
Flor Brown-Grossman, Professor, Universidad Nacional Autónoma de México

■ **Trade Liberalization and the Porter Effect: Theory and (Preliminary) Evidence from Mexico**
Kishore Gawande, Professor, Texas A&M University
Alejandro Islas-Camargo, Professor, Instituto Tecnológico Autónomo de México

Discussant 1: *Juan Rafael Elvira Quesada*, Deputy Attorney General, Profepa
Discussant 2: *Rick Van Schoik*, Managing Director, Southwest Center for Environmental Research and Policy
Rapporteur: *David Stern*, Professor, Rensselaer Polytechnic Institute

■ Business Environmental Decisions in the Context of the Free Trade Agreement

Lilia Domínguez-Villalobos and Flor Brown-Grossman

This study seeks to analyze the dynamics of environmental spending among Mexican manufacturing businesses between 1994, when NAFTA came into effect, and 2002, as well as the factors that have had a positive or negative influence on the environmental decisions taken by businesses. The information source for this report is the Mexican Annual Industry Survey, covering 6,000 establishments (which contribute around 70 percent of industrial GDP) from and 205 industrial classes. The study was conducted using econometric models with the value of capital invested or capital assets for environmental purposes as dependent variable and various explanatory variables. Results indicate that companies' stocks of environmental assets have increased over the period, although a long road lies ahead, especially for the micro, small, and medium-size enterprises. The size, pressure from foreign shareholders, business' technological capabilities, business sales performance, standards imposed by international customers, and previous spending were found to significantly affect environmental investment decisions. For larger firms, NAFTA is not found to be associated with lax environmental behavior. Technological improvements and export markets provided incentives to increase environmental investments. However, a massive modernization process did not occur and the majority of pollution caused by small and medium-size enterprises persists and is uncontrolled.

■ Trade Liberalization and the Porter Effect: Theory and (Preliminary) Evidence from Mexico

Kishore Gawande and Alejandro Islas-Camargo

Does trade liberalization make the environment dirtier or cleaner? Theory suggests both possibilities. The so-called "composition effect" changes the mix of goods produced either according to comparative advantage, or due to foreign factor inflows, particularly capital. It may or may not cause degradation of the environment in a country that has a comparative advantage in the production of pollution intensive goods. Other researchers have found that trade liberalization, and NAFTA in particular, does not exacerbate the building up of pollution havens in less developed partner countries, a prime example being Mexico. Why that is so is the working hypothesis that motivates our study.

The "Porter effect hypothesis" is the idea that environmental regulation actually spurs innovation that is both environment-friendly and productivity-improving. This hypothesis focuses on innovation "offsets," or the ability of properly designed environmental standards to trigger innovation that may offset partially or fully the cost of complying with these standards. The Porter effect hypothesis runs diametrically counter to the pollution haven hypothesis. Empirical support for the hypothesis is mainly from case studies; it has not been substantiated by systematic econometric evidence. This paper aimed to fill this gap in the literature.

While there have been studies at the level of countries and industries, because they are at such a highly aggregate level, these studies are unable to capture the mechanism by which trade liberalization leads to cleaner environment. They are unable to distinguish, say, political economy at work or the ability of the income effect to dominate the composition and scale effects. We set out to answer the following questions.

- **Has trade liberalization in NAFTA countries spurred investments that are environment-friendly?**
- **Has trade liberalization in NAFTA countries altered environmental polices in investment receiving nations like Mexico?**
- **Did investments by multinational and Mexican firms inside Mexico (into newer technologies) have favorable environmental consequences?**

We obtained access to the deputy attorney for environmental audits (Profepa) data under an agreement of confidentiality. We hired consultants to prepare an electronic database from the raw data recorded by Profepa on the monitoring and pollution output of approximately 3,000 firms. These included maquiladoras, Mexican firms, and transnational firms inside Mexico. The data were basically self-reported by firms in answer to surveys conducted by Profepa auditors. These surveys have not been used to analyze the trade and environment issue, as the data were not publicly available.

Unfortunately, the data required to test the Porter effect hypothesis—data on actual pollution outcomes—are very incomplete and quite unreliable. Interviews with experts led us to understand that since there is no enforcement mechanism to verify or check the veracity of the data on pollution, they are easily falsified, and often are, in order to not attract the attention of Profepa. It also led us to question the veracity of the investment data. While they are actually quite completely recorded, there is no verification of these data, and they could very well be "cheap talk" by the person self-reporting the data. We hope that Profepa will correct this deficiency in the future so the important relationship between trade liberalization and (possibly good) environmental outcomes may be tested.

Reactions of Juan Rafael Elvira Quesada, Discussant 1 for Session 2B

In response to comments made by Studer and Gawande in their presentations, Profepa can attest, from its daily encounters with Mexican industry, to the value that industry sees in obtaining a certification of compliance with environmental laws. So far, 3,900 companies have obtained certificates attesting compliance called under the "Industria Limpia" program. These are the larger companies and they contribute 62 percent of the industrial Gross Domestic Product in Mexico. A recent agreement reached by Profepa will maintain the annual inspections of certified industry to ensure continuous compliance.

Profepa and Semarnat realize that researchers may encounter problems with the available data, as was the case for instance with Gawande, and we stand ready to provide the information needed for their research. The new Access to Information law in Mexico ensures that all agencies will provide information that is requested.

Mexico can also attest to the usefulness of international regulations. As an example, a few years ago, Mexico adopted an international law requesting the treatment of wood used in packaging of traded goods. As a result, officials discovered that 70 percent of the wood used in the country to build shipping crates had been illegally harvested. In addressing this problem, they were also able to avoid the dispersal of invasive species and protect forest from illegal logging.

Also, related to previous presentations, Mexico has reached an agreement to decrease the sulfur in gasoline and diesel fuel. To achieve the new, lower standards by 2009, the government is planning to program an investment of $2.7 million over the next two to three years. In addition, the industrial compliance rate has risen to 38 percent, from 20 percent in 2001, and the majority of noncompliance is administrative in nature. It is worth nothing that the automobile, beer, and cement sectors have a 100 percent compliance rate. Even if sectors are 100 percent compliant, however, Profepa is committed to evaluate their compliance once a year, to be certain of keeping the 100 percent rate and follow up on companies producing hazardous waste to trace where these wastes end up. Profepa is also asking the CEC to conduct an environmental assessment of its activities.

Reactions of Rick Van Schoik, Discussant 2 for Session 2B

This session addresses three main questions: (1) did NAFTA enable exporting industry to improve environmental performance; (2) did NAFTA empower government to regulate, monitor, and enforce; and (3) can we, after even 12 years, start to assess trade effects? Drawing from Gallagher's work, we know that without environmental policies in place, economic integration exacerbates environmental problems; enacting environmental policies will not scare away investment; and most positive economic effects are offset by negative pollution effects. In a way, the situation at the US-Mexico border is a "NAFTA laboratory." We are seeing an evolution from an old agricultural economy by phases to a Mexican "Silicon Valley."

The Domínguez-Villalobos and Brown-Grossman paper shows how investments in product and process innovation offsets can be measured, but that production output, regulatory monitoring, and source emissions data are difficult to obtain under voluntary regimes and, even when they are obtained, the quality is of doubtful value.

The authors explore factors affecting environmental dynamics spending before and since NAFTA came into force. They find that: (1) company size enables better environmental performance; (2) exporting may help build size; (3) massive modernization did not occur; (4)

widespread pollution persists; (5) investment is highly concentrated; and (6) external pressure is not sufficient to conclude that environmental compliance occurs in the absence of government enforcement.

I would suggest that transboundary environmental impact assessment should be used to communicate problems; that energy service companies be involved to maximize efficiencies; and that trade in renewable energy certificates and renewable energy be fostered.

Reactions of David I. Stern, Rapporteur for Session 2B

I would like to focus my discussion on three issues: the issue of whether relationships between NAFTA and the environmental impacts documented in the presented papers are causal; data quality and availability; and developing countries efforts to address environmental issues.

Several papers investigate in greater depth what has actually occurred in Mexico, but can we say they identify causal relations? Many apparent correlations between variables are purely coincidental. More sophisticated statistical techniques can help identify what is or is not causal. Let's take, for example, the well-known Environmental Kuznets curve: is that relation also a spurious one? Several econometric and theoretical studies show that this model is not robust and is an inadequate representation of the data. Though income per-capita is relevant, it is not the only important factor. When models are estimated with limited datasets, statistically biased estimates result. Better models show that though pollution emissions are increasing in income, countries at all income levels can lower emissions over time by adopting improved technologies.

These points relate directly to my other two points. Data quality and availability plays a key role in understanding which relationships are real and which are not. I thus strongly endorse previous speakers' call for the CEC to play a role: (1) as clearinghouse or portal to existing government data and datasets created by researchers, and (2) working with the governments of the Parties to improve environmental data and make them more user-friendly for researchers and the general public. Cross-fertilization of work would also be facilitated by a greater awareness of the CEC in the environmental economics community. For example, I had never heard of the CEC prior to being contacted to serve on this symposium advisory group.

Also, there appears to be an improved effort from developing countries—environmental clean-up efforts are occurring at lower income levels than in the past. Lower-income countries don't have to reinvent the wheel. They have access to more sophisticated technologies than today's developed countries had when they were at similar income levels. The evidence presented in the symposium about Mexico adds to the evidence from other countries, in particular, China. Another example is the recent reduction of air pollution in New Delhi, which Kishore Gawande mentioned. But there really isn't anything that new about this. Japan was the first country to significantly cut sulfur dioxide emissions. When Japan adopted these policies in the 1960s, it was far from the richest country in the world. By contrast, emissions continue to rise in Australia. These observations support the econometric evidence that the development-pollution relationship is rather more complex than suggested by the Environmental Kuznets curve model. Alternative models include efficient production frontier models, with more complex patterns of technology diffusion and adoption (as in my own empirical research), and modified economic growth models (as in the work of Brock and Taylor).

SESSION 2C: **NAFTA RULES AND INSTITUTIONS AND THE ABILITY OF NAFTA PARTIES TO DECOUPLE ECONOMIC GROWTH AND ENVIRONMENTAL CHANGE**

■ **The NAFTA Environmental Agreement: The Intersection of Trade and the Environment**
Jon Plaut, President, Global Learning Inc

■ **Environmental policy implications of investor-state arbitration under NAFTA's Chapter 11**
Sanford E. Gaines, Professor, University of Houston

■ **Opportunities and barriers for renewable energy development in NAFTA**
Robert L. Howse, Expert and Professor, University of Michigan
and Renewable Energy and International Law Project (REILP)
Petrus van Bork, Consultant

Discussant: *Howard Mann*, Associate, International Institute for Sustainable Development
Rapporteur: *Richard Newfarmer*, Economic Advisor, World Bank

■ The NAFTA Environmental Agreement: The Intersection of Trade and the Environment

Jon Plaut

The NAFTA Commission for Environmental Cooperation (the CEC) has acted at the interface of environmental concerns and burgeoning hemispheric trade by undertaking cooperative programs and pursuing its unique features and relationships across North America, including through interactions at the local level. Specific and deliberate actions encouraging and promoting green products, phasing out harmful chemicals, creating a continent-wide accounting system of emissions, supporting grass roots programs, such as the health of trans-boundary workers, and partnering in conservation exemplify. The very existence of citizens' rights to challenge the adequacy of government enforcement activity (Article 14 and 15 of the North American Agreement on Environmental Cooperation), and for the CEC's Secretariat to make independent findings, allows for transparency and public participation at points of environment and trade controversy. A role of the Joint Public Advisory Committee (JPAC) is to act as the public's advocate by providing a mechanism to defend the process of citizen challenge. JPAC's major contribution towards a new environment and trade dialogue is the creation of North American constituency for the CEC. Of equal importance is the continuously spun web of the CEC's public involvements, as can be gleaned, for example, by the regional and local activities of JPAC over the first eight-year period. The existence of the NAFTA environmental side agreement itself, too, with its unique features assuring transparency and public input provide the opportunity for achieving mutually supportive trade and environment policies.

Environmental Policy Implications of Investor-State Arbitration Under NAFTA Chapter 11

Sanford E. Gaines

Have investors used NAFTA Chapter 11 to thwart the fair application of environmental protection measures? Are the compensation awards discouraging governments from taking environmental protection measures they would otherwise want to take? This report empirically reviews four arbitrations under Chapter 11 to try to answer those two questions. The case studies address the first question objectively. The government paid compensation in three cases (Metalclad, Ethyl, and S.D. Myers) in which the government had little scientific information to support its action and the surrounding circumstances strongly indicate that environmental protection was a cover for local political battles and economic motivations. In the two cases against Canada, the federal government withdrew the measure in question and the underlying environmental issue later resolved itself through changes in technology and market pressures. Nine years after Metalclad filed its case against Mexico, the ecological zone declared by the state governor to block the landfill has yet to be formally created or funded, there is no modern hazardous waste disposal capacity in industrialized central Mexico, pre-existing environmental contamination at the site still has not been cleaned up, and Mexico has had to compensate a Spanish investor in a similar case. In the fourth NAFTA arbitration (Methanex), the investor was found not to have a claim under Chapter 11. Moreover, the Chapter 11 tribunal concluded that California had identified a legitimate environmental problem and conducted independent scientific assessment before adopting the MTBE ban.

The answer to the second question—is Chapter 11 "chilling" government environmental protection efforts—is more elusive and subjective, but the report infers from the available evidence that the chilling effect, if it exists at all, is not significant. After Metalclad, Mexico improved environmental regulation with new legislation to establish a national strategy for management of hazardous waste and to improve transparency of public decision making. The circumstances in Canada are less clear, but Ethyl's fuel additive is scarcely used anymore in Canada, and the handling of PCB wastes involved in S.D. Myers has shifted to technologies besides stationary incinerators. In the United States, the Methanex Chapter 11 claim did not dissuade other states from following California in banning MTBE. Moreover, the dismissal of the Methanex claim shows that Chapter 11 does not create an easy route to challenge environmental measures. After the four early cases studied here, only one Chapter 11 claim in the last five years involves substantive matters of environmental regulation. Meanwhile, the governments have made Chapter 11 procedures significantly more open and transparent.

Opportunities and Barriers for Renewable Energy in NAFTA

Robert L. Howse and Petrus van Bork
Renewable Energy and International Law Project

This paper consists of four parts: the first reviews the energy market in the NAFTA countries and the nature of the demand for renewable energy, as well as surveying the renewable energy industry in Canada, the US and Mexico; part two is an overview of governmental measures in the NAFTA countries, including to some extent at the subnational level, to support the development of renewable energy markets, encourage the use of renewable sources of energy, and to eliminate or reduce grid access and other barriers for renewables; part three examines whether generally speaking the kinds of measures reviewed in part two could be in violation of, or disciplined by, legal norms in NAFTA and also considers whether certain legal provisions of NAFTA could be used to improve transboundary market access for renewables (for instance, the technical standards provisions). A previous CEC document had argued that US state renewable portfolio standard (RPS) laws, which require retail sellers of electricity to include in their portfolios a certain percentage or amount of electricity from renewable sources, may violate the National Treatment provisions in the GATT.[3] This conclusion is in large part based on the assumption that "electricity produced from renewable resources has exactly the same qualities as electricity generated from other (conventional) resources and it is the same whether domestically produced or imported." We contend that renewables could be found to be unlike products and thus support for renewables legitimate. The final part draws some lessons and conclusions for consideration of NAFTA governments. Over the last two decades, trade and environment issues have typically been a source of intense controversy and conflict in both the world and regional trading systems, reflecting and intensifying cleavages between environmentalists and supporters of free trade, and between developed and developing countries. Renewable energy, however, represents an area where based on previous analysis freer less-distorted trade and environmental protection have the potential to be mutually reinforcing.

[3] Gary Horlick, Christiane Schuchhardt and Howard Mann, NAFTA Provisions and the Electricity Sector, (Commission for Environmental Cooperation, Article 13 Initiative, Background Paper, Electricity and the Environment, 8 Nov 2001).

Reactions of Howard Mann, Discussant for Session 2C

Gaines' essential conclusion is that Chapter 11 has not and should not have an impact on environmental protection. Yet, Dan Esty, in his keynote address, highlights that NAFTA's biggest mistake was Chapter 11. I am concerned that the methodology used is insufficient to support the broad conclusions reached. Major concerns with this methodology include: (1) too few cases were studied, (2) it excludes impacts of legal conclusions of non-environmental cases which were not studied (3) the cases themselves say nothing about the impacts of the claims on regulatory chill, (4) the reliance on Article 1114: "…otherwise consistent with this agreement", and (5) the empirical analyses of cases contain inaccuracies because too few and often less than objective outside sources were used.

Drawbacks remain with Chapter 11. The Methanex case, for instance, was a welcomed process and substance improvements, but is not a binding decision on any future panel, either on the process or the substance. There is no appeals process to make it binding and the results are tribunal-dependent, which means they remain easily distorted. The FTC statements on transparency remain policy, not law. There might be potential blowback in the Weiler and Schreuer cases. On the regulatory chill argument, I would like to point out that in the Ethyl case, NGOs had to do what government could not do, the US does now what Canada was fined for doing in the S.D. Meyers case on a temporary basis. To analyze the chilling effect, I believe one needs access to government legal opinions.

I agree with Rob Howse's paper. There is an apparent disagreement with previous CEC study on "like products," due to time lag for preparation and the Asbestos case, primarily. The real issue is likely not between non-renewables and renewables, but with artificial distinctions among renewables themselves. Subsidies may still be a problem, but are not central. One problem raised is that nothing in NAFTA requires the granting of a permit to build a transboundary powerline that does not otherwise meet the applicable environmental and national interest tests.

Jon Plaut's paper relates his personal experience with the citizen submission process, JPAC, and other public processes, focusing on impressive public participation component of NAAEC. It was nice to hear from inside, the belief in NAAEC success.

Jon pointed to improvement needed in building constituency, trilateral accountability, and financial support to the CEC. The limitations of his paper are that, despite some specific positive results, the success of these important components is not enough to ensure the success of the NAAEC/CEC. That is, the public process does not substitute for environmental results nor does it make the CEC important or relevant to the nations' environment ministers. For instance, the environmental mandate given to the newly created North American Security, Prosperity Partnership (known as SPP) should be a loud warning bell: Is it because the CEC does not have the confidence of the governments? The CEC must be made relevant to the ministers. The NAAEC has allowed the Free Trade Commission to say that the environment is "over there" (at the CEC). In reality, nothing in the NAAEC has been influencing the operation of the FTC; trade officials come here, but environment officials do not go there. I will conclude with a simple and loud question: "is the CEC struggling to succeed now, or is it simply struggling to survive?"

Reactions of Richard Newfarmer, Rapporteur for Session 2C[4]

The panel's theme could be summarized in the question: "Has NAFTA facilitated better environmental performance through institutional and legal measures?" The short answer is yes. But the news is not all good. First, the CEC has, according to participants, not realized its full potential and indeed confronts some formidable challenges in the near future. Second, dangers lurk in the dispute settlement process that requires attention and careful monitoring, lest future decisions take a course that could prejudice environmental progress. Let me elaborate through the lens of the three papers.

Institutions

Jon Plaut dealt eloquently with the success, opportunities, and challenges that the CEC and JPAC face. I won't recapitulate the successes he cites but do commend his paper to you for his readable first-hand account. To realize its potential, the CEC could seize new opportunities to expand its activities; among them he and others have suggested:

- **Improving access to environmental and trade data that would facilitate analysis**
- **Taking on an active role of promoting renewable energy**
- **Exploring the possibility of becoming more actively involved with carbon trading programs.**[5]

But to succeed in furthering its current activities and moving into these types of new areas, the discussion also pointed out challenges posed by the fact that environment is widely perceived as less a priority than it has been in North America. Moreover, the CEC struggles with constrained resources, as the Mexican government is not always current with its dues. Finally, all three countries seem to be retreating toward an inward-focused unilateralism. Jon put it eloquently: "We do not live in a time of great respect for multilateral treaties." These factors are challenges that all of us concerned about the environment, trade, and international efforts to improve both must rise up to meet squarely.

Legal issues

Sanford Gaines' excellent paper posed two interesting questions and offered insightful analysis in answering them:

- **Have foreign investors used NAFTA to escape disciplines of reasonable environmental regulations?**
- **Have NAFTA decisions exerted a chilling effect on environmental regulatory oversight?**

He addresses these questions by analyzing in assiduous detail the four decisions that concerned environment-related disputes, considering the facts of the case, the legal logic of the decisions as well as the larger context of what happened before and after. His conclusions are sanguine. In general, the decisions do not lead to the conclusion that foreigners escaped regulation; in fact, he finds the decisions to be reasonably well balanced and narrow. Nor does he find that the dispute settlement process exerted a negative chilling effect, citing the facts that several US states enacted bans on MBTE after the NAFTA case was filed and that the Mexican Congress also took action to strengthen environmental regulation after the decision. Howard Mann, in his comment, was not persuaded. Mann noted that these were still early days; that Gaines' paper, although dealing with the universe of environmentally related cases, was necessarily a small sample; and that it did not deal with the problems set through precedents

[4] I begin the task of summarizing the final panel with one asset and two liabilities. The asset is that many of you just heard the panel so I can be brief and my job is relatively easy. The first liability is that I find myself to be the lone economist on a panel of brilliant lawyers—and the translators, excellent as they were, were of little help with their legalese. The second is that pressure of time has forced me to resort to pen and paper, and reading my own tortured handwriting will undoubtedly introduce its own random errors into this report.

[5] Let me note that the World Bank has established an active trading market associated with the EU, Canada and Japan, and should the CEC staff wish to visit Washington to explore collaboration, I am sure they would be well received.

in other cases that could be interpreted in subsequent cases to limit environmental regulation or create subsequent disincentives to regulators. This was especially the case because of recent large damage awards to plaintiffs in investor-state cases in Eastern Europe.

The second paper, by Rob Howse and Petrus van Bork, explored the question of whether NAFTA created legal barriers or regulatory disincentives to trade in renewable energy. Their answer was a nuanced no. There appeared to be no obstacles to offering subsidies, provided that national treatment applied and that an "unlike products" standard were in place. They also asked whether NAFTA could provide a forum to eliminate other impediments to renewables trade, such as differing technical standards. And they conclude that indeed NAFTA could play a more active role in this area. One was left with the view that the main obstacles to renewable energy trade were not found in NAFTA disciplines and regulations, but the relative costs of production and other technical considerations.

Conclusions

Let me conclude with three points I take away from this panel and, indeed, from the conference as a whole. First, the evidence in the papers for this conference—beginning with David Stern's opening paper and evident in several others—is that by and large we are seeing some convergence of environmental quality and environmental standards in the NAFTA area. And the good news is that these tend to be the higher, not lower, standards. Furthermore, in several papers, we have seen that NAFTA itself—and the CEC, in particular—has played a generally positive role in the process in disseminating standards. The Plaut paper cites several examples of direct actions at the border. However, the main role of NAFTA may be indirect: The higher standards of Canada and the United States have compelled companies operating in Mexico to adopt better technologies in order to serve the northern markets; NAFTA, by encouraging integration through foreign investment, trade, and information flows, has thus given impetus to this dissemination of standards.

Second, I come away with the view that regional trade agreements like NAFTA are a more effective channel to use trade and trade rules to improve environment than is the WTO and its multilateral approach. It is difficult enough to forge plurilateral agreements on managing trade and environment among three countries, but, as we are seeing in Geneva, virtually impossible to get 148 WTO member countries to agree on this complex regulatory agenda. Progress on the basic WTO trade agenda has been halting, and eventual complete collapse of the Doha round cannot be ruled out. Adding yet more complexity to multilateral trade negotiations is likely to doom the reciprocal trade liberalization efforts altogether—and with them, eventual disciplines that curb environmentally harmful agricultural practices and open markets to more efficient use of resources that would help the environment.

This does not mean abandoning multilateral initiatives to improve the environment, however. This leads to my third point. Multilateral efforts are desperately needed. Whether its climate change, controlling CFC emissions to protect the ozone layers, or preserving ocean life, to name a few issues—all require that countries work together to adopt standards of production and latest technologies to reduce environmental impacts. We have had some successes, such as the Montreal Protocol. We need more. New bilateral initiatives for environmental improvement are also needed. The US EPA has had a long-standing, if under-funded, program of activities with the Chinese government to help them set standards, improving emissions monitoring, analyze health damages, and develop policy alternatives. Helping countries improve their domestic standards through bilateral assistance and expertise is a more effective channel to raise standards around the world than trade agreements because the resulting higher local standards apply to all investment and production, not just that small portion affected by the trade agreement. Thus, those of us that care about the environment cannot rely solely—or even primarily—on trade agreements as the primary vehicle to promulgate good environmental policies.

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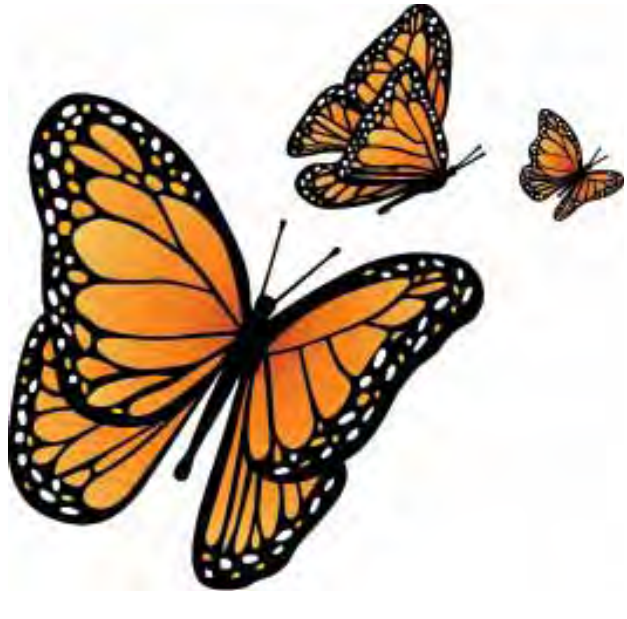

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