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United States-Canada Air Quality Agreement: A Framework for Addressing Transboundary Air Pollution Problems

Introduction

Transboundary air pollution has long plagued relations between the United States and Canada.¹ On March 13, 1991, the United States and Canada entered into a bilateral agreement on air quality. This Note analyzes the agreement and concludes that the agreement sets up a comprehensive framework in which the United States and Canada can effectively address problems of transboundary air pollution.

First, this Note describes the nature and scope of the acid rain problem between the United States and Canada. Section II surveys past bilateral, multilateral, and domestic attempts to address this problem, concluding that such efforts were ineffective. Section III discusses the bilateral negotiations and difficulties the countries encountered in reaching an agreement. Finally, this Note examines the resulting 1991 Air Quality Agreement and concludes that this agreement is indeed "another successful chapter in the 'world's most successful bilateral environmental relationship.'"²

I. Nature of the Transboundary Air Pollution Problem in North America

Transboundary pollution occurs when a pollution source in one country creates a pollutant that crosses into the territory of another country, producing adverse effects.³ Although many forms of transboundary air

1. See generally *ACID RAIN AND FRIENDLY NEIGHBORS: THE POLICY DISPUTE BETWEEN CANADA AND THE UNITED STATES* (Jurgen Schmandt & Hilliard Roderick eds., 1988) [hereinafter *FRIENDLY NEIGHBORS*].

2. *Bush Says U.S.-Canada Air Quality Agreement Signifies 'Extraordinarily Strong' Relations*, 14 Int'l Env'tl. Rep. (BNA) 174 (1991) (quoting Canadian Prime Minister Brian Mulroney).

3. For purposes of this Note, the term transboundary air pollution will be used synonymously with long-range transboundary air pollution. The Economic Commission for Europe has defined long-range transboundary air pollution as "air pollution whose physical origin is situated wholly or in part within the area under the national jurisdiction of one State and which has adverse effects in the area under the jurisdiction of another State. . . ." Convention on Long-Range Transboundary Air Pollution, Nov. 13, 1979, T.I.A.S. No. 10541 [hereinafter *ECE Convention*].

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pollution exist, the most publicized and controversial transboundary air pollution problem is acid rain.

A. Nature of Acid Rain

Acid rain, or more accurately "acid deposition,"⁴ refers to all forms of acid precipitation, including rain, snow, sleet, hail, fog and mist, as well as the dry deposition of compounds that form acids when they contact surface water.⁵ Although all forms of precipitation are naturally acidic, human activities have drastically increased precipitation acidity.⁶

The main chemical precursors to acid rain are sulphur oxides and nitrogen oxides.⁷ When these gases come into contact with water, either in the atmosphere or on the earth's surface, they are spontaneously oxidized to form sulphuric acid and nitric acid.⁸ Sulphur dioxide and nitrogen oxide result from the burning of coal, oil, and other fossil fuels.⁹ More than ninety percent of acid rain is due to man-made emissions of sulphur oxides and nitrogen oxides, with sulphur oxides causing two-thirds of the problem.¹⁰

The major sources of sulphur dioxide emissions in North America are electric utilities.¹¹ Natural sources account for only 5 to 25 percent of sulphur dioxide emissions.¹² The major sources of nitrogen oxides in North America are electric utilities, transportation, and industry.¹³ Natural sources only account for approximately 10 percent of the total

4. See JAMES L. REGENS & ROBERT W. RYCROFT, *THE ACID RAIN CONTROVERSY* 35 (1988).

5. *Id.* at 35-36.

6. *Id.* at 36-37. Annual rainfall in the eastern United States has been estimated to be ten to forty times more acidic than normal due almost entirely to manmade sources of pollutants. Michael Oppenheimer, *Reducing Acid Rain in Eastern North America: The Scientific Basis for an Acid Rain Control Policy*, 19 J. L. REFORM 989 (1986).

7. THE NATIONAL ACID PRECIPITATION ASSESSMENT PROGRAM, NAPAP, INTERIM ASSESSMENT: THE CAUSES AND EFFECTS OF ACIDIC DEPOSITION I-4 (Executive Summary, 1987) [hereinafter NAPAP]; REGENS & RYCROFT, *supra* note 4, at 41-42.

8. NAPAP, *supra* note 7, at I-4; REGENS & RYCROFT, *supra* note 4, at 42. The transformation from sulfur dioxide to sulfate (sulfuric acid) may take from several hours to several days. The transformation from nitrogen dioxide to nitrate (nitric acid) is probably completed within a few hours. *Id.* These rates are affected by emission rate, weather, and air concentration. NAPAP, *supra* note 7, at I-4.

9. ROY GOULD, *GOING SOUR: SCIENCE AND POLITICS OF ACID RAIN* 5-6 (1985).

10. FRIENDLY NEIGHBORS, *supra* note 1, at 61.

11. *Id.* at 46; GREGORY S. WETSTONE & ARMIN ROSENCRANZ, *ACID RAIN IN EUROPE AND NORTH AMERICA: NATIONAL RESPONSES TO AN INTERNATIONAL PROBLEM* 14 (1983). The majority of emissions in the United States come from coal-fired power plants. GOULD, *supra* note 9, at 49. The remainder come chiefly from industrial, commercial and residential combustion, transportation, smelters, and industrial processes. *Id.* In Canada, metal smelters are the largest emitters of sulfur oxides. *Id.*

12. WETSTONE & ROSENCRANZ, *supra* note 11, at 14. Natural sources include ocean spray, volcanic emissions, hot springs, and natural decay processes in soil. *Id.* In the eastern United States, "sulfur oxide and nitrogen dioxide emissions from man-made sources are estimated to be at least ten times greater than those from natural sources . . ." REGENS & RYCROFT, *supra* note 4, at 45.

13. FRIENDLY NEIGHBORS, *supra* note 1, at 46.

nitrogen oxide emissions.¹⁴

Most reports indicate that there has been an historical increase in the quantity of sulphur oxide and nitrogen oxide emissions in North America, although some reports have qualified their findings.¹⁵ As of the early 1980s, the annual sulphur dioxide emissions for the United States totalled approximately 25.7 million tons, a 26 percent increase since 1940.¹⁶ Canada's annual sulphur dioxide emissions totalled approximately 5.2 million tons.¹⁷ These increases are attributable mainly to the demand for electricity.¹⁸ Nitrogen oxide emissions, while lower than sulphur dioxide emissions, have also increased in the United States to an estimated annual emission level of approximately 23 million tons as of 1980.¹⁹ Canada's nitrogen oxide emissions increased to approximately 2 million tons per year.²⁰ The increase of nitrogen oxide emissions in the United States and Canada is due primarily to increasing power plant and motor vehicle emissions.²¹

B. Transport of Acid Rain and Acid Rain Precursors

Acid rain recognizes no national boundaries. Both the precursors and their acidic products may remain airborne for several days and travel hundreds or thousands of miles before falling back to earth.²² Tracing environmental damages to the source of emissions is not possible with presently available information and technology.²³ Nevertheless, current long-range transport models support the general thesis that pollutant emissions substantially contribute to the deposition of acid rain and its precursors in areas far downwind.²⁴

With regard to transboundary movements of acid rain and its precursors between the United States and Canada, an estimated three to four times as much sulphur dioxide moves across the border from the United States to Canada than moves in the opposite direction.²⁵ Emissions of sulphur dioxide from United States sources account for approx-

14. GOULD, *supra* note 9, at 53.

15. FRIENDLY NEIGHBORS, *supra* note 1, at 39-40.

16. CANADA/UNITED STATES AIR QUALITY AGREEMENT - PROGRESS REPORT, March 1992, at 29 [hereinafter PROGRESS REPORT] (copy on file with the *Cornell International Law Journal*); WETSTONE & ROSENCRANZ, *supra* note 11, at 14.

17. PROGRESS REPORT, *supra* note 16, at 29.

18. WETSTONE & ROSENCRANZ, *supra* note 11, at 14.

19. PROGRESS REPORT, *supra* note 16, at 30.

20. *Id.*

21. WETSTONE & ROSENCRANZ, *supra* note 11, at 14-15.

22. TRANSBOUNDARY AIR POLLUTION: INTERNATIONAL LEGAL ASPECTS OF THE CO-OPERATION OF STATES 1 (Cees Flinterman et al. eds., 1986) [hereinafter TRANSBOUNDARY AIR POLLUTION]; WETSTONE & ROSENCRANZ, *supra* note 11, at 3. The transport process is affected by many factors including weather, global wind, a pollutant's residence time (time it remains aloft), and the height from which emissions are released. FRIENDLY NEIGHBORS, *supra* note 1, at 42. High smokestacks magnify the transboundary pollution problem. TRANSBOUNDARY AIR POLLUTION, *supra*, at 1.

23. FRIENDLY NEIGHBORS, *supra* note 1, at 43.

24. WETSTONE & ROSENCRANZ, *supra* note 11, at 22.

25. FRIENDLY NEIGHBORS, *supra* note 1, at 45.

imately one-half of Canada's sulphur-sourced acid rain.²⁶

C. Effects of Acid Deposition

Scientists are only beginning to understand the scope and nature of the possible impacts of acid rain on the environment and human health.²⁷ Most studies agree that acidification can degenerate, reduce, or destroy various species populations and damage certain aquatic ecosystems.²⁸ However, the effects of acid rain on terrestrial vegetation, soils, and human health are less certain.²⁹ Although studies are inconclusive, enough evidence exists to justify serious concern.³⁰

Acid rain's adverse impact on aquatic ecosystems has been extensively documented.³¹ The evidence conclusively points to chemical and biological changes in aquatic ecosystems affected by acidic inputs,³² resulting in the degeneration, reduction, or extinction of species, populations of fish, reptiles, crustaceans, microbiotic life, insects, and aquatic vegetation.³³

Knowledge of the effect of acid rain on terrestrial vegetation and soil comes largely from laboratory experimentation, and is therefore limited.³⁴ Most studies indicate, however, that acid rain can and often does substantially damage soil.³⁵ Studies have also indicated that acid rain may cause damage to leaves, roots, and microorganisms that form beneficial "symbiotic relationships"³⁶ with roots.³⁷ Acid rain may also decrease a plant's resistance to other forms of stress, including pollution, climate, insects, and disease-causing microorganisms.³⁸

Scientists also associate acid rain with urban damage, especially to building stone, paint, and metals.³⁹ Furthermore, acid rain has been

26. *Id.* at 45.

27. See generally FRIENDLY NEIGHBORS, *supra* note 1, at 31-63; REGENS & RYCROFT, *supra* note 4, at 48-58.

28. See FRIENDLY NEIGHBORS, *supra* note 1, at 48-49.

29. See *id.*; REGENS & RYCROFT, *supra* note 4, at 48-51.

30. See generally FRIENDLY NEIGHBORS, *supra* note 1, at 31-63; REGENS & RYCROFT, *supra* note 4, at 48-58.

31. FRIENDLY NEIGHBORS, *supra* note 1, at 49.

32. REGENS & RYCROFT, *supra* note 4, at 48.

33. FRIENDLY NEIGHBORS, *supra* note 1, at 48. Hundreds of lakes and streams in the Adirondacks, Ontario and Nova Scotia have lost their fish. GOULD, *supra* note 9, at 67.

34. FRIENDLY NEIGHBORS, *supra* note 1, at 49.

35. *Id.* at 49. Areas with soil low in naturally calcareous minerals (which would neutralize the acidity) are especially vulnerable. Eastern Canada, the Southeastern United States, New England and the North Central United States fit this description. WETSTONE & ROSENCRANZ, *supra* note 11, at 28.

36. The term "symbiosis" refers to "[a] close, sustained living together of two species or kinds of organisms." 14 NEW ENCYCLOPEDIA BRITANNICA 995 (15th ed. 1987).

37. GOULD, *supra* note 9, at 67-68.

38. *Id.* at 68.

39. REGENS & RYCROFT, *supra* note 4, at 50-51; WETSTONE & ROSENCRANZ, *supra* note 11, at 36-37. It is estimated that air pollution in the United States causes from \$2 to \$4 billion annually in damage to urban materials. *Id.* at 37.

linked to possible health hazards, caused indirectly through the ingestion of drinking water and foods affected by acid rain, and directly through the inhalation of acid rain precursors such as sulphur oxides.⁴⁰

While there is still a great degree of uncertainty concerning the qualitative relationship between the causes and effects of acid rain and specific source-receptor relationships,⁴¹ the scientific community does agree that the acid rain problem is severe and likely to get worse.⁴² There is also agreement that human activities are the main source of the problem.⁴³

II. History of United States-Canadian Efforts to Resolve Transboundary Pollution Problems

In the context of North American pollution problems, the United States and Canada have a long history of progressive environmental relations,⁴⁴ dating back to the early 1900s and continuing today.

A. Laying the Foundation: United States-Canadian Efforts to Resolve Transboundary Water Pollution Problems

1. 1909 Boundary Waters Treaty and the International Joint Commission

The 1909 Boundary Waters Treaty⁴⁵ is primarily concerned with navigation⁴⁶ and the uses and diversion⁴⁷ of "waters from main shore to main shore of the lakes and rivers and connecting waterways . . . along which the international boundary between the United States and . . . Canada passes . . ." ⁴⁸ The second paragraph of Article IV, however, addresses pollution, stating that waters flowing across the boundary should not be polluted.⁴⁹

Significantly, the Treaty established the International Joint Com-

40. WETSTONE & ROSENCRANZ, *supra* note 11, at 37-38. One study estimated that 150,000 deaths in 1970 were associated with sulfate pollution. *Id.* at 39. See also PROGRESS REPORT, *supra* note 16, at 52-54.

41. "[D]amage to specific areas cannot be traced to specific sources of the precursor emissions." FRIENDLY NEIGHBORS, *supra* note 1, at 45.

42. *Id.* at 58.

43. *Id.*

44. See Agreement on Great Lakes Water Quality, Nov. 22, 1978, U.S.-Can., 30 U.S.T. 1383, T.I.A.S. No. 9257, reprinted in 30 I.L.M. 676 (as amended 1983) [hereinafter Water Quality Agreement]; Boundary Waters Treaty, Jan. 11, 1909, U.S.-Gr. Brit., 36 Stat. 2448, T.S. No. 548 [hereinafter Boundary Waters Treaty]; Convention for Settlement of Difficulties Arising from Operation of Smelter at Trail, B.C. (U.S. v. Can.), 49 Stat. 3245, T.S. No. 893, 3 Rep. Int'l Arb. Awards 1905 (1941) [hereinafter Trail Smelter].

45. Boundary Waters Treaty, *supra* note 44.

46. *Id.* art. I.

47. *Id.* arts. II, III.

48. *Id.* preliminary art.

49. "[B]oundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other." Boundary Waters Treaty, *supra* note 44, art. IV; R. James Steiner, *The North American Acid Rain Problem: Applying International Legal Principles Economically; Without Burdening Bilateral Relations*, 12 SUFFOLK TRANSNAT'L L. J. 3, 13 (1988).

mission ("IJC"),⁵⁰ a Commission still in existence today. The IJC is comprised of six Commissioners, three from each country.⁵¹ The IJC meets at least semiannually, and is presided over by a chairman from the country in which the meeting is held.⁵² Under the Boundary Waters Treaty, the IJC was given mandatory jurisdiction over the "use or obstruction or diversion of the [boundary] waters."⁵³ Under Articles IX and X of the Boundary Waters Treaty, the IJC was also given broad authority to investigate other matters referred to it by either nation.⁵⁴ Therefore, although the IJC was set up originally to monitor progress toward achievement of the Boundary Waters Treaty objectives and to assist in resolving disputes under the Treaty,⁵⁵ it has been called upon to resolve or address many additional issues such as air quality, social and economic matters, and aesthetics.⁵⁶

Under the Boundary Waters Treaty, the IJC's powers to curb boundary water pollution are very limited. Article IV, although prohibiting pollution of boundary waters, is silent on the authority of the IJC to monitor or initiate investigations into pollution generating activities.⁵⁷ The IJC's powers over boundary water pollution are limited to those matters referred to it under Articles IX and X.⁵⁸ Even when a referral is made under Article IX, the IJC is limited to examining and reporting on the facts and circumstances of the particular matter.⁵⁹ The IJC cannot

50. Steiner, *supra* note 49, at 13.

51. Water Quality Agreement, *supra* note 44, art. VII.

52. Timothy M. Gulden, *Transfrontier Pollution and the International Joint Commission: A Superior Means of Dispute Resolution*, 17 Sw. U.L. REV. 43, 58 (1987).

53. Boundary Waters Treaty, *supra* note 44, art. VIII. IJC decisions in this area are binding on both nations. Gulden, *supra* note 52, at 59, n.149.

54. Article IX states in part:

[A]ny other questions or matters of difference arising between them involving the rights, obligations, or interests of either [party] in relation to the other or to the inhabitants of the other, along the common frontier between the United States and the Dominion of Canada, shall be referred from time to time to the International Joint Commission for examination and report, whenever either [party] shall request that such questions or matters of difference be so referred.

Boundary Waters Treaty, *supra* note 44, art. IX. Article X states in part:

Any questions or matters of difference arising between the High Contracting Parties involving the rights, obligations, or interests of the United States or of the Dominion of Canada either in relation to each other or to their respective inhabitants, may be referred for decision to the International Joint Commission by the consent of the two Parties

Boundary Waters Treaty, *supra* note 44, art. X. IJC reports made pursuant to articles IX or X are not binding on either party. *Id.*, *supra* note 44, arts. IX, X.

55. WETSTONE & ROSENCRANZ, *supra* note 11, at 123.

56. Gulden, *supra* note 52, at 60; FRIENDLY NEIGHBORS, *supra* note 1, at 197. *See, e.g.*, THIRD ANNUAL MICHIGAN-ONTARIO AIR POLLUTION ANNUAL REPORT, Docket 99 R (1978) (IJC determined that a common international ozone standard should be adopted where U.S. and Canadian standards are inconsistent). Gulden, *supra* note 52, at 60-61; WETSTONE & ROSENCRANZ, *supra* note 11, at 124.

57. Boundary Waters Treaty, *supra* note 44, art. IV; FRIENDLY NEIGHBORS, *supra* note 1, at 192-93.

58. FRIENDLY NEIGHBORS, *supra* note 1, at 192-93.

59. Boundary Waters Treaty, *supra* note 44, art. IX.

enforce compliance with the recommendations it makes.⁶⁰ Only with respect to matters referred to it for arbitration under Article X may it issue binding decisions. Neither country has, however, referred any matters under Article X.⁶¹

2. 1972 and 1978 Great Lakes Water Quality Agreements

The United States and Canada further defined their determination to address transboundary pollution in the Great Lakes Water Quality Agreements of 1972⁶² and 1978.⁶³ These agreements expanded the jurisdiction of the IJC to include the protection of water quality in the Great Lakes basin. Unfortunately, these Agreements did not grant the IJC the necessary powers to adequately address transboundary air pollution problems.

The 1972 Water Quality Agreement was one of the first international agreements to set water quality standards for boundary waters.⁶⁴ The Agreement established general and specific water quality objectives for the Great Lakes, set a timeframe in which these objectives were to be met, expanded the power of the IJC to implement the agreement, and authorized the establishment of two international boards to assist the IJC, namely the Great Lakes Water Quality Board and the Great Lakes Science Advisory Board.⁶⁵ The Great Lakes Water Quality Board is the principal advisor to the IJC.⁶⁶ The Great Lakes Science Advisory Board provides advice on research and consists of "managers of Great Lakes research programs and recognized experts on Great Lakes water quality problems and related fields."⁶⁷ The 1972 Agreement served as the "initiation of a process of pollution control that required coordinated efforts

60. Boundary Waters Treaty, *supra* note 44, Art. IX; FRIENDLY NEIGHBORS, *supra* note 1, at 193. See, e.g., *infra* notes 78-81 and accompanying text.

61. FRIENDLY NEIGHBORS, *supra* note 1, at 192. Experts have offered several reasons for the reluctance of Canada and the United States to use this arbitration provision. First, both countries have tended to settle disputes by negotiation rather than by arbitration through a third party. Second, the United States would have to seek Senate approval to such arbitration. Third, both countries have viewed the IJC's role narrowly (to issues involving the boundary waters), not wanting to strain the IJC's resources by expanding its tasks. Finally, arbitrations are timely and costly. *Id.*

62. Agreement on Great Lakes Water Quality, Apr. 15, 1972, U.S.-Can., 23 U.S.T. 301, T.I.A.S. No. 7312.

63. Water Quality Agreement, *supra* note 44. The 1978 Water Quality Agreement supplemented the 1972 accord, outlining with much greater specificity the steps to be taken to achieve water quality objectives. WETSTONE & ROSENCRANZ, *supra* note 11, at 124. Further amendments were made to the Water Quality Agreement in 1983. Supplementary Agreement Amending the Agreement on Great Lakes Water Quality, Oct. 16, 1983, U.S.-Can., T.I.A.S. No. 10798. References made to the Water Quality Agreement take these amendments into account.

64. WETSTONE & ROSENCRANZ, *supra* note 11, at 123.

65. FRIENDLY NEIGHBORS, *supra* note 1, at 201.

66. Water Quality Agreement, *supra* note 44, art. VIII(1). Its members consist of equal numbers from the United States and Canada, including representatives from the parties and each State and Provincial Governments. *Id.* art. VIII(1)(a).

67. *Id.* art. VIII(1)(b).

on both sides of the Great Lakes."⁶⁸

The 1978 Water Quality Agreement revised the general and specific objectives of the 1972 Agreement, set new deadlines for meeting these objectives, and expanded further the scope of the IJC's powers.⁶⁹ Yet the 1978 Agreement still failed to provide the IJC with any enforcement powers.⁷⁰

The 1978 Water Quality Agreement addressed the issue of transboundary air pollution⁷¹ but in a very limited context. The United States and Canada agreed to develop and implement "[P]rograms to identify pollutant sources and relative source contributions . . . for those substances which may have significant adverse effects on environmental quality . . ." ⁷² This provision is only concerned, however, with air pollution adversely affecting the Great Lakes Water Basin.⁷³ Thus, the 1978 Water Quality Agreement does not provide an effective means for addressing the problems of transboundary air pollution.

B. Establishing Principles of International Environmental Law: Early United States-Canadian Efforts to Resolve Transboundary Air Pollution

1. *The Trail Smelter Arbitration—1949*

The Trail Smelter Arbitration was the first major controversy between the United States and Canada regarding transboundary air pollution.⁷⁴ This case arose from United States' allegations that sulphur dioxide fumes from a smelter in Trail, British Columbia were causing environmental damage to property in Washington State.⁷⁵ Canada and the United States initially submitted the dispute to the International Joint Commission under Article IX of the 1909 Boundary Waters Treaty.⁷⁶ The report of the IJC, recommending that the smelter company reduce its emissions to a point where no damage would occur in the United States, was subsequently ignored by both parties.⁷⁷

68. FRIENDLY NEIGHBORS, *supra* note 1, at 202.

69. *Id.* at 202.

70. The IJC has been highly respected, however, and its recommendations have been very influential in both the United States and Canada. Gregory Wetstone & Armin Rosencranz, *Transboundary Air Pollution: The Search for an International Response*, 8 HARV. ENVTL. L. REV. 89, 134 (1984) [hereinafter *International Response*].

71. Water Quality Agreement, *supra* note 44, art. VI(1)(l).

72. *Id.* art. VI(1)(l).

73. Erik K. Moller, Comment, *The United States-Canadian Acid Rain Crisis: Proposal for an International Agreement*, 36 UCLA L. REV. 1207, 1224 (1989).

74. Steiner, *supra* note 49, at 15.

75. FRIENDLY NEIGHBORS, *supra* note 1, at 236-37.

76. Joel A. Gallob, *Transboundary Environmental Plaintiff: Transboundary Pollution and the 1979 Draft Treaty for Equal Access and Remedy*, 15 HARV. ENVTL. L. REV. 85, 119-120 (1991).

77. Elizabeth Knapp, *Our Neighbor's Keeper? The United States and Canada: Coping with Transboundary Air Pollution*, 9 FORDHAM INT'L L.J. 159, 176-77, n.126 (1985-86). This example illustrates the weakness of the IJC enforcement powers.

At this point, the two countries entered into negotiations that resulted in an executive agreement whereby Canada agreed to pay for previous damage caused in the United States. Both parties agreed to form an arbitration tribunal for deciding any future indemnification payments and mitigation measures.⁷⁸ The arbitration tribunal applied international principles of territorial sovereignty and external responsibility to determine that Canada had a duty to prevent injuries from the use of Canadian property and should be held liable for damage caused in the United States.⁷⁹ The tribunal stated:

[U]nder the principles of international law, as well as of the law of the United States, no state has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of a serious consequence and the injury is established by clear and convincing evidence.⁸⁰

Significantly, the tribunal imposed emission limitations on the smelter's operations.⁸¹

Although the Trail Smelter principle of external responsibility has received significant weight in the field of international law, it has failed to curb the majority of North American transboundary air pollution problems for two main reasons. First, the decision was binding only because the tribunal was acting under a previously executed agreement between Canada and the United States which gave it jurisdiction and power over the dispute.⁸² This dispute resolution approach has not been common.⁸³

Second, the Trail Smelter case involved a relatively simple scenario, in a local setting, where the link between source and damage was clear. Canada had acknowledged the causation link between the Smelter's emissions and the resulting property damage in the United States even before the tribunal met. This left only the assessment of damages and mitigation measures to be decided by the tribunal.⁸⁴ This causation link is typically not a serious obstacle in disputes involving short-range air pollution problems. In cases involving the long-range transport of transboundary air pollutants, however, modern technology is incapable

78. Trail Smelter, *supra* note 44; Gallob, *supra* note 76, at 120; Knapp, *supra* note 77, at 176-77, n.126.

79. Steiner, *supra* note 49, at 15-16; Gallob, *supra* note 76, at 120.

80. Trail Smelter, *supra* note 44, at 1965; Steiner, *supra* note 49, at 16; Gallob, *supra* note 76, at 120.

81. Gallob, *supra* note 76, at 120.

82. *Id.* at 121. This kind of negotiation usually involves high costs—both economic and political. *Id.*

83. FRIENDLY NEIGHBORS, *supra* note 1, at 192. Both governments have favored settling such disputes by negotiation rather than by reference to a third party for binding arbitration. *Id.*

84. Steiner, *supra* note 49, at 16. The Trail Smelter tribunal announced that a state is obligated not to allow its air pollution to affect another state "where injury is established by clear and convincing evidence." Trail Smelter, *supra* note 44, at 1965.

of establishing with certainty the necessary causation link.⁸⁵ Thus, the arbitration approach taken by the United States and Canada in resolving the Trail Smelter dispute, and the precedent set by the case, are of little practical value in resolving issues of long-range transboundary air pollution.⁸⁶

2. Multilateral Agreements Addressing Transboundary Air Pollution

a. 1972 Stockholm Declaration: Development of International Environmental Law

The 1972 United Nations Conference on the Human Environment in Stockholm marked the beginning of a heightened consciousness of international environmental issues worldwide. The Conference also stimulated the development of international environmental law.⁸⁷ The Conference adopted a U.N. Declaration on the Human Environment, to which both the United States and Canada are signatories, that elaborates on a State's external responsibility to protect the environment.⁸⁸ Principle 21 provides that:

States have, in accordance with the Charter of the United Nations and the principle of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.⁸⁹

The 1972 Declaration is an important component in the development of international environmental law.⁹⁰ The 1972 Declaration and other accepted principles of international law, however, have not effec-

85. Steiner, *supra* note 49, at 17; *International Response*, *supra* note 70, at 123. The acid rain problem involves the transport of pollution emissions from hundreds of polluters over thousands of miles of boundary. Steiner, *supra* note 49, at 17.

86. See Gallob, *supra* note 76, at 121; *International Response*, *supra* note 70, at 123.

87. JUTTA BRUNNEE, *ACID RAIN AND OZONE LAYER DEPLETION: INTERNATIONAL LAW AND REGULATION* 81 (1988); *International Response*, *supra* note 70, at 92. Some credit this conference with being the first to thrust the concern for acid rain onto the world stage. J. Regens & R. Rycroft, *Options for Financing Acid Rain Controls*, 26 NAT. RESOURCES J. 519 (1986).

88. Steiner, *supra* note 49, at 21.

89. *Report of the United Nations Stockholm Conference on the Human Environment*, U.N. Doc. A/Conf.48/14 (1972) (Principle 21), reprinted in 11 I.L.M. 1416, 1421 (1972) (emphasis added) [hereinafter 1972 U.N. Declaration]. Principle 21 recognizes the competing principles of absolute territorial sovereignty; the right of a sovereign state to exploit its own resources without interference from foreign states; and external responsibility—the obligation of a state to consider the extraterritorial impacts of its internal actions on other States. Susan C. Cagann, Comment, *Finding a Common Ground for Canada and the United States to Resolve Acid Rain Disputes*, 1988 J. DISP. RESOL. 175, 179 (1988); See generally Anthony Scott, *The Canadian-American Problem of Acid Rain*, 26 NAT. RESOURCES J. 337 (1986).

90. BRUNNEE, *supra* note 87, at 84. Additional authority for the principal of external responsibility may be found in the holding of the International Court of Justice in the 1949 Corfu Channel case. *Corfu Channel Case*, in *THE INTERNATIONAL LAW OF POLLUTION* 75-77 (J. Bartos & D. Johnston eds., 1974). The court held that Albania had an obligation to warn ships in territorial waters that those waters contained minefields and declared that it is "every State's obligation not to allow knowingly its

tively curbed long-range transboundary air pollution for four major reasons.⁹¹

First, such general statements concerning the duty of states towards other states do not provide adequate guidance to nations as to what type of conduct is unacceptable.⁹² Present international legal doctrines are not easily applied to specific controversies.⁹³

Second, even if these principles were sufficiently clear to provide meaningful guidance, no effective enforcement mechanism exists.⁹⁴ An international agency can only give force to those international environmental principles that are directly incorporated into binding agreements⁹⁵ or are accepted as customary international law.⁹⁶ Even the most respected international adjudicatory body, the International Court of Justice, may rule on a case only after the involved nations have consented to a reference.⁹⁷

Third, these general principles of international environmental law do not adequately foster preventive actions, despite their marginal deterrent value.⁹⁸ Disputes to which such principles would apply typically arise only after the environmental damage has occurred.⁹⁹

Finally, these international doctrines do not solve the proof of causation problem associated with air pollution injuries. This problem of proof remains a major obstacle given the technological difficulty in tracing point source air pollution emissions to environmental damages coupled with the demanding causation requirement that courts have imposed on plaintiffs claiming environmental injuries.¹⁰⁰

territory to be used for acts contrary to the rights of other States." *Id.* at 76; *see also* Trail Smelter, *supra* note 44.

For a discussion of whether Principal 21 may form the basis of customary international law, *see* Steiner, *supra* note 49, at 22 (citing the Statute of the International Court of Justice, art. 38(1)(b) (in addition to treaties and general principles of law accepted by civilized nations, customary international law is a principle underlying the imposition of international law on parties)). *See also* John Ntambirweki, *The Developing Countries in the Evolution of an International Environmental Law*, 14 *HASTINGS INT'L & COMP. L. REV.* 905, 909 (1991) (the norms Principal 21 prescribes may form the basis of customary rules of international law).

91. *See International Response, supra* note 70, at 122-23.

92. *Id.* at 122.

93. *Id.*

94. *Id.*

95. *Id.* The 1972 Declaration is not a binding agreement. *Id.*

96. Statute of the International Court of Justice, art. 38(1)(b), 59 Stat. 1031, T.S. No. 993.

97. Statute of the International Court of Justice, *supra* note 96, arts. 36, 37; *see International Response, supra* note 70, at 122-23.

98. *International Response, supra* note 70, at 123.

99. *Id.*

100. *Id.*; *see supra* notes 23, 89 and accompanying text (discussing the difficulty in tracing environmental damages to point sources of emissions); *see also supra* notes 83, 84 and accompanying text (the Trail Smelter tribunal suggested a clear and convincing standard for proving the causation link between emissions and damage).

b. Economic Commission for Europe Convention on Long-Range Transboundary Air Pollution

On November 13, 1979, thirty-one industrial nations, including Canada and the United States, became parties to the Economic Commission for Europe ("ECE")¹⁰¹ Convention on Long-Range Transboundary Air Pollution.¹⁰² Under the ECE Convention, the parties agree to develop "policies and strategies" to combat the discharge of air pollutants,¹⁰³ focusing on those pollutants that cause damage outside of a state's boundaries.¹⁰⁴ The Convention establishes a framework for international cooperation in monitoring and research activities, and in assembling and disseminating information on national emissions, pollution control, and energy policies.¹⁰⁵ The Convention also imposes "notice and consultation" requirements on national policy changes likely to have a "significant risk of long-range transboundary air pollution" affecting citizens of other states.¹⁰⁶

Although an improvement over past agreements addressing the problem of long-range transboundary air pollution, the ECE Convention inadequately addressed the transboundary air pollution problem between the United States and Canada for three main reasons.¹⁰⁷ First, the ECE Convention imposes only limited obligations which are stated in general terms. Article 2 provides:

The Contracting Parties, taking due account of the facts and problems involved, are determined to protect man and his environment against air pollution and shall endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution.¹⁰⁸

The clauses "taking due account of the facts and problems involved," "shall endeavor to limit," and "as far as possible, gradually reduce and prevent air pollution" reflect an effort to limit obligations and to preserve discretion.¹⁰⁹ Additionally, the ECE Convention provides that in developing policies regarding air quality management, the nations are to consider the cost and effectiveness of existing remedies,

101. Members of the ECE include not only the Western and Eastern European countries, but also Canada, the United States, Australia, and New Zealand. Gallob, *supra* note 76, at 123.

102. ECE Convention, *supra* note 3. The ECE Convention was ratified and entered into force in 1983. Steiner, *supra* note 49, at 23. For a comprehensive discussion of the ECE Convention, see Lothar Gündling, *Multilateral Co-operation of States Under the ECE Convention on Long-Range Transboundary Air Pollution*, in *TRANSBOUNDARY AIR POLLUTION*, *supra* note 22, at 19-61.

103. In article 3 of the ECE Convention, "[t]he Contracting Parties [agreed to] develop without undue delay policies and strategies which shall serve as a means of combating the discharge of air pollutants. . . ." ECE Convention, *supra* note 3.

104. Steiner, *supra* note 49, at 22.

105. ECE Convention, *supra* note 3, arts. 7, 8, and 9.

106. ECE Convention, *supra* note 3, arts. 5, 8.

107. Gallob, *supra* note 76, at 126.

108. ECE Convention, *supra* note 3, art. 2.

109. Gündling, *supra* note 102, at 22.

accommodate the need for “balanced development,” and use control technology that is “economically feasible.”¹¹⁰ The ECE Convention imposes obligations, therefore, in general terms with ample room for avoidance.

Second, the obligations to inform and consult are also stated very reluctantly. The duty to consult, outlined in Article 5, is provided only as a “fundamental principle.” Article 5 requires only that the parties consult, upon request, if one of the parties is actually affected or exposed to a “significant risk of long-range transboundary air pollution”¹¹¹ The right to request consultation is linked to difficult questions, such as: What is a “significant risk”? How is a “significant risk” to be determined, and to what extent must a nation investigate such risks?

The ECE Convention, in order to provide a means for answering these questions, imposes a duty to exchange information on “policies, scientific activities and technical measures” aimed at combatting air pollution.¹¹² This duty, however, is limited to those policies or activities “which may have adverse effects, thereby contributing to the reduction of air pollution including long-range transboundary air pollution.”¹¹³ Article 8 imposes a duty to exchange information on “major changes in national policies and in general industrial development, and their potential impact, which would be likely to cause significant changes in long-range transboundary air pollution.”¹¹⁴ This does not solve the problem, however, as it still requires an initial determination of whether a policy or action “would be likely to cause significant changes in long-range transboundary air pollution.”¹¹⁵

Third, the ECE Convention lacks any effective enforcement mechanism. The ECE Convention provides merely that “[i]f a dispute arises between two or more Contracting Parties to the present Convention as to the interpretation or application of the Convention, they shall seek a solution by negotiation or by any other method of dispute settlement acceptable to the parties to the dispute.”¹¹⁶ This dispute resolution clause does not impose any substantive obligations on the parties and rarely have nations been willing to consent to international adjudica-

110. ECE Convention, *supra* note 3, art. 6 provides:

Taking into account Articles 2 to 5, the ongoing research exchange of information and monitoring and the results thereof, the cost and effectiveness of local and other remedies and, in order to combat air pollution, in particular that originating from new or rebuilt installations, each Contracting Party undertakes to develop the best policies and strategies including air quality management systems and, as part of them, control measures compatible with balanced development, in particular by using the best available technology which is economically feasible and low and non-waste technology.

111. *Id.* art. 5.

112. *Id.* art. 4.

113. *Id.*

114. *Id.* art. 8(b).

115. *Id.*

116. *Id.* art. 13.

tions before the International Court of Justice.¹¹⁷

Three protocols were added to the ECE Convention in 1984, 1985, and 1988, which imposed more specific obligations.¹¹⁸ Unfortunately, these measures have also proved ineffective in significantly curbing transboundary air pollution between the United States and Canada. The 1984 Protocol, adopted by both Canada and the United States, encourages the financing of cooperative projects to monitor and evaluate the long-range transport of air pollutants in Europe.¹¹⁹ Obviously, financing such projects is a step in the right direction, but it does not solve any of the problems discussed above.

The 1985 Protocol¹²⁰ calls for a 30 percent reduction in sulphur emissions by each signatory.¹²¹ It also attempts to standardize emission calculations.¹²² Although Canada is a party to this Protocol, the United States is not. The provisions, therefore, cannot be applied against the United States.

The 1988 Protocol,¹²³ signed by both Canada and the United States, requires signatories to freeze their nitrous oxide emissions by December 31, 1994 at such levels as to not exceed "their national annual emissions of nitrogen oxides or their transboundary fluxes . . . of such emissions for the calendar year 1987 or any previous year."¹²⁴ The phrase "or any previous year," weakening the obligations of the Protocol, was added at the request of the United States which wanted to count pre-1987 reductions towards the reduction goal.¹²⁵

The ECE Convention and its Protocols provide a general framework in which countries are able to coordinate their efforts in curbing transboundary air pollution. But the Protocols contain no enforcement mechanisms or dispute resolution provisions. For these reasons, the

117. *International Response*, *supra* note 70, at 122-23.

118. Gallob, *supra* note 76, at 124.

119. *Protocol . . . On Long Term Financing of the Co-operative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe*, U.N. Doc. ECE/EB.AIR/11, reprinted in 27 I.L.M. 701 (1988).

120. *1985 Protocol on the Reduction of Sulphur Emissions or Their Transboundary Fluxes by at Least 30 Per Cent*, U.N. Doc. ECE/EB.AIR/12, reprinted in 27 I.L.M. 707 (1988) [hereinafter *1985 Protocol*].

121. "The Parties shall reduce their national annual sulphur emissions or their transboundary fluxes by at least 30 percent as soon as possible and at the latest by 1993, using 1980 levels as the basis for calculation of reductions." *Id.* art. 2.

122. Moller, *supra* note 73, at 1223, n.92.

123. *1988 Protocol Concerning the Control of Emissions of Nitrogen Oxides or Their Transboundary Fluxes*, reprinted in 28 I.L.M. 214 (1989) (this protocol came into effect on Feb. 14, 1991) [hereinafter *1988 Protocol*].

124. *Id.* art. 2. The 1988 Protocol initially required actual reductions, rather than a freeze tied to a particular year, but due to United States opposition to such stringent measures, the current approach was adopted. Gallob, *supra* note 76, at 124-25.

125. The 1988 Protocol also required that the signatories commence talks on further reductions. *1988 Protocol*, *supra* note 123, art. 2; Gallob, *supra* note 76, at 124. While approximately half of the signatories have committed to reduce nitrous oxide emissions to a greater extent than called for by the 1988 Protocol, many others have been reluctant to implement the 1988 Protocol due to the political problems associated with regulating automobiles, the primary source of nitrous oxides. *Id.* at 125.

ECE Convention has done little to combat the problems of long-range transboundary air pollution and acid rain.¹²⁶

3. *Domestic Efforts to Resolve the Acid Rain Problem*

Both the United States and Canada have a history of legislation directed at controlling air pollution. These attempts, however, focused on local problems and failed to adequately control the problem of transboundary air pollution.¹²⁷

a. United States Domestic Clean Air Act

Early versions of the United States Clean Air Act¹²⁸ reflected the misconceptions many policymakers shared about the nature of air pollution. The 1950s solution to air pollution, building taller smokestacks, was designed to address air quality problems associated with high pollutant concentrations near the pollution source, and gave no consideration to long-range air pollution problems.¹²⁹

In 1970, Congress attempted to remedy the problem of long-range air pollution which was exacerbated by its tall smokestack policy.¹³⁰ The 1970 amendment¹³¹ to the Clean Air Act placed sulphur dioxide and nitrogen dioxide on the Environmental Protection Agency's ("EPA") list of hazardous pollution and set national ambient air quality standards to limit the emission of these pollutants.¹³² This attempt to control long-range air pollution failed, however, because the standards limited only concentrations of local air pollution, not air pollution that travelled long distances.¹³³

The EPA Administrator finally issued regulations in 1982 to implement section 123 of the Act. However, these regulations do not apply to most sources with tall stacks because the Administrator leniently inter-

126. Gallob, *supra* note 76, at 124-26. "Judging by the modest effects of the 1979 . . . Convention and its protocols, voluntary self-restraint is insufficient to address the problem." *Id.* at 126.

127. Moller, *supra* note 73, at 1214-15; Gallob, *supra* note 76, at 134.

128. The Clean Air Act as now in force is at 42 U.S.C. §§ 7401-7642 (1988), amended by Pub. L. No. 101-549, 104 Stat. 2399 (1990). The Clean Air Act was originally enacted in 1963. Act of Dec. 17, 1963, Pub. L. No. 88-206, 77 Stat. 392 (1963). It was significantly amended in 1967, 1970, 1977 and 1990, with minor changes occurring more recently. Air Quality Act of 1967, Pub. L. No. 90-148, 81 Stat. 485 (1967); 1970 Clean Air Act Amendments, Pub. L. No. 91-604, 84 Stat. 1676 (1970); 1977 Clean Air Act Amendments, Pub. L. No. 95-95, 91 Stat. 385 (1977); 1990 Clean Air Act Amendments, Pub. L. No. 549, 104 Stat. 2399 (1990).

129. Steiner, *supra* note 49, at 18.

130. *Id.* at 18.

131. 1970 Clean Air Act Amendments, *supra* note 128.

132. Steiner, *supra* note 49, at 18-19; 1970 Clean Air Act Amendments, *supra* note 128, at 1676, 1678, 1679. National ambient air quality standards (NAAQS) are maximum permissible concentrations of certain air pollutants established by the EPA and implemented through pollution control requirements devised by the states. WERTSTONE & ROSENCRANZ, *supra* note 11, at 97.

133. Steiner, *supra* note 49, at 19. Taller smokestacks resulted. *Id.*

preted the phrase "good engineering practice."¹³⁴ The regulations allowed emitters to add pollution control mechanisms to bring their emissions within the levels that adjusting the stack height would have accomplished.¹³⁵ The regulations only aggravated the problem.

Congress also amended section 115¹³⁶ in 1977.¹³⁷ Section 115, as amended, authorizes the EPA Administrator to require states to revise their air quality implementation plans to eliminate emissions that "cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare in a foreign country."¹³⁸

The United States government must follow three steps before imposing section 115 control requirements.¹³⁹ First, the Administrator must find that emissions in the United States endanger public health or welfare in a foreign country.¹⁴⁰ Second, the Administrator must determine that the foreign country gives the United States reciprocal rights with respect to the control of international air pollution.¹⁴¹ Third, if such findings are made, the Administrator must formally notify the state(s) in which the emissions originate.¹⁴² The states notified must revise their implementation plans as needed to "prevent or eliminate the endangerment" to the foreign country.¹⁴³

Section 115 has proven to be of limited effectiveness in addressing the transboundary air pollution problem.¹⁴⁴ Two D.C. Circuit decisions illustrate this point. *Thomas v. New York*¹⁴⁵ stemmed from conclusions of

134. Steiner, *supra* note 49, at 20; WETSTONE & ROSENGRANZ, *supra* note 11, at 101.

135. Steiner, *supra* note 49, at 20. Pollution emitters have used computer models to justify maintaining their current stack height. *Id.* at 20.

136. 1977 Clean Air Act Amendments, Pub. L. No. 95-95, § 115, 91 Stat. 685, 710 (current version at 42 U.S.C. 7415 (1988)).

137. *Id.*; see generally Stuart N. Keith, *The EPA's Discretion to Regulate Acid Rain: A Discussion of the Requirements for Triggering Section 115 of the Clean Air Act*, 36 CLEV. ST. L. REV. 133 (1988); Bennett A. Caplan, Note, *The Applicability of the Clean Air Act Section 115 to Canada's Transboundary Acid Precipitation Problem*, 11 B.C. ENVTL. AFF. L. REV. 539 (1984); *The Transnational Implications of Acid Rain*, 5 CAN.-U.S. L.J. 2 (1981). Section 115 had previously dealt with both interstate and international air pollution.

138. § 115, 91 Stat. at 685-710; *International Response*, *supra* note 70, at 127.

139. § 115, 91 Stat. at 685-710.

140. § 115, 91 Stat. at 685-710. Previously, to trigger this section, the Administrator had to determine that pollution originating in the United States endangered "the health or welfare of persons in a foreign country. . . ." Act of Oct. 20, 1965, Pub. L. No. 89-272, 79 Stat. 992, 995; John L. Sullivan, *Beyond the Bargaining Table: Canada's Use of Section 115 of the United States Clean Air Act to Prevent Acid Rain*, 16 CORNELL INT'L L.J. 193, 209 (1983). The 1977 amendment omitted the word "person," and incorporated the phrase "public health or welfare" to include effects on the natural and man-made environment, as well as effects on persons. *Id.*

141. § 115, 91 Stat. at 685-710; *International Response*, *supra* note 70, at 128. See generally Sullivan, *supra* note 140 (discussing section 115's legislative history in defining reciprocity). Most commentators agree that Canada has satisfied the reciprocity requirement. See generally *id.*; see also Moller, *supra* note 73, at 1217.

142. § 115, 91 Stat. at 685-710; *International Response*, *supra* note 70, at 128.

143. § 115(b), 91 Stat. at 685-710.

144. See Moller, *supra* note 73, at 1217-19; *International Response*, *supra* note 70, at 128.

145. *Thomas v. New York*, 802 F.2d 1443 (D.C. Cir. 1986).

the EPA Administrator, Douglas Costle, in 1981, that United States sources were contributing to "atmospheric overloadings over some sensitive areas of Canada," that transboundary acid deposits were causing harm to both Canada and the United States, and that "[s]ection 115 authority could appropriately be used to develop solutions."¹⁴⁶ The D.C. Circuit Court of Appeals held that the endangerment and reciprocity findings pursuant to section 115 must be made in accordance with the notice and public comment requirements of the Administrative Procedure Act.¹⁴⁷ Because Costle had not followed these procedures, the court held the findings invalid.¹⁴⁸ As one commentator has stated, "[a]t a minimum, . . . [this] decision will require that future attempts to invoke section 115 involve an often time-consuming rulemaking procedure."¹⁴⁹

In *Her Majesty the Queen in Right of Ontario v. EPA*,¹⁵⁰ the D.C. Circuit Court of Appeals rejected an argument that the EPA acted arbitrarily by denying the requests of Ontario and the state of New York that the EPA make endangerment and reciprocity findings under section 115.¹⁵¹ The court concluded, based on the statute; that unless the EPA was prepared to identify specific sources in specific states as contributors to air pollution endangering public health or welfare in Canada, and to call for additional controls on those sources, there would be no point in issuing the endangerment and reciprocity findings.¹⁵² The court also rejected an argument that the EPA had unreasonably delayed those findings. The court stated that any delay was reasonable given the permissibility of the EPA's "unitary proceeding" interpretation and the complexity of the scientific and technical questions involved.¹⁵³

These two decisions substantially limit the utility of section 115 by requiring costly and time-consuming proceedings and by restricting attempts to initiate such proceedings.¹⁵⁴ The problems are magnified

146. Gallob, *supra* note 76, at 128 (quoting letter from Douglas Costle, EPA Administrator to Senator George Mitchell (Jan. 13, 1981), reprinted in WETSTONE & ROSENCRANZ, *supra* note 11).

147. *Thomas*, 802 F.2d at 1446; Administrative Procedure Act, 5 U.S.C. §§ 551, 553 (1988).

148. *Thomas*, 802 F.2d at 1447.

149. Gallob, *supra* note 76, at 130.

150. *Her Majesty the Queen in Right of Ontario v. EPA*, 912 F.2d 1525 (D.C. Cir. 1990).

151. *Ontario*, 912 F.2d at 1535. The EPA denied the requests because it interpreted section 115 as requiring a "unitary proceeding," rather than a bifurcated proceeding. The endangerment and reciprocity findings would be made in one proceeding and the issuance of formal notices to the states to mandate implementation revisions in a separate proceeding. *Id.* at 1534. Ontario had not requested, at this point, that the administrator issue notices to any states.

152. *Id.* at 1534-35.

153. *Id.*

154. See Gallob, *supra* note 76, at 130. "[I]t is doubtful that section 115 of the Clean Air Act will be useful in lowering the United States' transboundary air pollution contribution." Moller, *supra* note 73, at 1219. See generally Sullivan, *supra* note 140.

by the scientific uncertainty surrounding transboundary air pollution. Such uncertainties can be used to justify the Administrator's decision not to initiate section 115 proceedings. In addition, by giving the Administrator little guidance and wide discretion, Congress has left the process of invoking section 115 open to political pressure.¹⁵⁵

b. Canadian Clean Air Act

Canadian air pollution laws are comparable to the United States Clean Air Act controls, involving elements of federal and provincial control.¹⁵⁶ In Canada, however, the federal role is primarily one of guidance and the provinces remain relatively autonomous.¹⁵⁷

Section 21.1 of the Canadian Clean Air Act¹⁵⁸ is very similar to section 115 of the United States Clean Air Act with respect to international pollution.¹⁵⁹ Under section 21.1(1), if the Environmental Minister determines that "an air contaminant emitted . . . in Canada creates or contributes to the creation of air pollution that may reasonably be expected to constitute a significant danger to the health, safety or welfare of persons in any other country," he shall "recommend to the [cabinet] . . . such specific emission standards . . . as he may consider appropriate for the elimination or significant reduction of that danger."¹⁶⁰ Except with regard to federal sources, the Minister is not authorized to make such a recommendation without first determining that provincial action cannot adequately address the problem.¹⁶¹ If the province can mitigate the problem, the Minister must attempt to secure such action.¹⁶² If the cabinet feels that the Minister has made a "reasonable but unsuccessful endeavor" to secure provincial action, and that the other country provides reciprocal rights, it is in turn authorized to prescribe specific emission standards.¹⁶³

155. *International Response*, *supra* note 70, at 132.

156. Moller, *supra* note 73, at 1217; Sullivan, *supra* note 140, at 213.

157. Sullivan, *supra* note 140, at 213.

158. R.S.C. ch. C-32 (1985) (the Canadian Environmental Protection Act, proclaimed as law by the Canadian Parliament on June 30, 1988, consolidates within a single instrument a number of pieces of legislation including the Canadian Clean Air Act).

159. Sullivan, *supra* note 140, at 217-218; *International Response*, *supra* note 70, at 130. The legislative history of the 1980 amendments to section 21.1 indicates that the purpose of the amendments was to ensure reciprocity with section 115 of the United States Clean Air Act. Sullivan, *supra* note 140, at 219; *International Response*, *supra* note 70, at 130, n.247.

160. An Act to Amend the Clean Air Act, ch. 45, 1980 C. Gaz. 1159, 1160 (Part III) (§ 21.1(1)). Sullivan, *supra* note 140, at 218. "[H]ealth, safety or welfare of persons" is not defined in the Canadian Clean Air Act, although the legislative history of the 1980 amendments indicates that this phrase includes affects on the environment. See *id.* at 219.

161. 1980 C. Gaz. at 1161 (§ 21.1(3)(a)-(d)).

162. *Id.* at 1162 (§ 21.2(2)).

163. *Id.* at 1162 (§ 21.2(1)); Sullivan, *supra* note 140, at 218-19. The foreign country must provide "by law for essentially the same kind of benefits in favor of Canada with respect to abatement or control of air pollution as is provided in favour of that country by virtue of this Act." 1980 C. Gaz. 1160 (§ 21.2(1)).

The implementation of section 21.1 of the Canadian Clean Air Act has been of less pressing concern than the enactment of section 115 of the United States Clean Air Act.¹⁶⁴ Canada contributes proportionally less to the overall air pollution problems in the United States than the United States contributes to air pollution problems in Canada.¹⁶⁵ Not surprisingly, Canada has been historically more eager to establish programs addressing transboundary air pollution than has the United States.¹⁶⁶ Therefore, the main significance of section 21.1 is in satisfying the reciprocity requirement of section 115 of the United States Clean Air Act.¹⁶⁷

III. Working Towards a Bilateral Agreement on Transboundary Air Pollution

A. Beginning Negotiations

Transboundary air pollution first became the subject of negotiation between the United States and Canadian governments in 1978, prompted by an International Joint Commission¹⁶⁸ study showing that a high proportion of pollutants entering the Great Lakes came from the atmosphere.¹⁶⁹ The talks were also triggered by a Canadian proposal to construct two new oil-fired thermal generating plants across the border from Montana and Minnesota.¹⁷⁰ In October 1978, the two countries established the Bilateral Research Consultation Group on Long-Range Transport of Air Pollutants.¹⁷¹

On June 20, 1979, based on this group's first report showing that large areas of North America were sensitive to acidic deposition, Canada and the United States issued a Joint Statement on Transboundary Air Quality¹⁷² in which both countries committed to reduce certain types of transboundary air pollution identified as injurious to health, ecosystems and property.¹⁷³ In the Joint Statement, the parties reiterated their

164. *International Response*, *supra* note 70, at 131.

165. *See supra* note 25 and accompanying text.

166. WETSTONE & ROSENCRANZ, *supra* note 11, at 114-15.

167. *See supra* note 141 and accompanying text; *see also International Response*, *supra* note 70, at 131.

168. *See supra* notes 50-61, 71-73 and accompanying text.

169. FRIENDLY NEIGHBORS, *supra* note 1, at 65.

170. *Id.*

171. *Id.*; Steiner, *supra* note 49, at 27; WETSTONE & ROSENCRANZ, *supra* note 11, at 124.

172. Joint Statement on Transboundary Air Quality by the Government of Canada and the Government of the United States of America, July 26, 1979, *reprinted in* OFFICE OF TECHNOLOGY ASSESSMENT, 97TH CONG., 2D SESS., FINAL REPORT—LONG RANGE AIR POLLUTION ACROSS NATIONAL BOUNDARIES: RECOURSES IN LAW AND POLICY—A U.S.-CANADA CASE STUDY, app. I (1982) [hereinafter Joint Statement]; WETSTONE & ROSENCRANZ, *supra* note 11, at 124.

173. The Joint Statement listed the principles to be addressed in formulation of an agreement on transboundary air quality:

prevention and reduction of transboundary air pollution which results in deleterious effects of such a nature as to endanger human health, harm living

adherence to the principles of international environmental responsibility established in the 1909 Boundary Waters Treaty¹⁷⁴ and Principle 21 of the 1972 United Nations Declaration.¹⁷⁵

B. 1980 Memorandum of Intent

On August 5, 1980, the United States and Canada signed a more formal and specific "Memorandum of Intent Concerning Transboundary Air Pollution."¹⁷⁶ This document is significant for three main reasons. First, in this Memorandum of Intent, the parties made a commitment to develop a bilateral agreement concerning transboundary air pollution as soon as possible.¹⁷⁷ Second, the parties agreed "to take interim actions available under current authority to combat transboundary air pollution."¹⁷⁸ Third, the parties established a joint coordinating committee to begin negotiations on the bilateral agreement no later than June 1, 1981.¹⁷⁹

C. U.S. Policy of Research Before Action: Stalemate

For over a decade following the signing of the Memorandum of Intent in 1980, the countries failed to achieve significant progress in negotiating a bilateral agreement.¹⁸⁰ When the Reagan Administration took office in 1981, it gave environmental concerns a much lower priority than the

resources and ecosystems, and impair or interfere with amenities and other legitimate uses of the environment; and expanded notification and consultation on matters involving a risk or potential risk of transboundary air pollution.

Joint Statement, *supra* note 172; WETSTONE & ROSENCRANZ, *supra* note 11, at 125.

174. Boundary Waters Treaty, *supra* note 44.

175. 1972 U.N. Declaration, *supra* note 89; see FRIENDLY NEIGHBORS, *supra* note 1, at 66.

176. Memorandum of Intent Concerning Transboundary Air Pollution, Aug. 5, 1980, U.S.-Can., 20 I.L.M. 690 [hereinafter Memorandum of Intent].

177. Memorandum of Intent, *supra* note 176; FRIENDLY NEIGHBORS, *supra* note 1, at 66; WETSTONE & ROSENCRANZ, *supra* note 11, at 125. The parties agreed specifically "to develop a bilateral agreement which will reflect and further the development of effective domestic control programs and other measures to combat transboundary air pollution . . . [and] to facilitate the conclusion of such an agreement as soon as possible." Memorandum of Intent, *supra* note 176, at 691.

178. Memorandum of Intent, *supra* note 176; FRIENDLY NEIGHBORS, *supra* note 1, at 66; WETSTONE & ROSENCRANZ, *supra* note 11, at 125. Both countries agreed specifically to:

(a) develop domestic air pollution control policies and strategies, and as necessary and appropriate, seek legislative or other support to give effect to them; (b) promote vigorous enforcement of existing laws and regulations as they require limitation of emissions from new, substantially modified and existing facilities in a way which is responsive to the problems of transboundary air pollution.

Memorandum of Intent, *supra* note 176, at 691-92.

179. Memorandum of Intent, *supra* note 176, at 691; FRIENDLY NEIGHBORS, *supra* note 1, at 66.

180. Moller, *supra* note 73, at 1211; Fitzhugh Green, *Acid Rain and U.S.-Canadian Relations*, 9 WASH. Q. 103 (1986).

Carter Administration.¹⁸¹ The Reagan Administration felt that the scientific evidence concerning acid rain was inconclusive, asserting that further research was necessary prior to implementing any comprehensive and expensive control programs.¹⁸² The U.S. EPA even went so far as to allow increases in emission levels, reflecting "a generally unreceptive U.S. attitude toward the development of a cooperative solution to bilateral pollution problems."¹⁸³

Other major factors underlying the Reagan Administration's reluctance to act involved the extent of emissions that would be affected by any abatement programs and the costs associated with such programs.¹⁸⁴ Abatement programs in the United States would cost more than similar programs in Canada, due primarily to the disproportionate level of transboundary air pollution originating within the United States,¹⁸⁵ and also to the higher costs associated with controlling emissions from the dominant polluting industries in the United States as compared to those in Canada.¹⁸⁶ Furthermore, the politics of acid rain in the United States are more complex than in Canada.¹⁸⁷ The separation of powers, the power of special interest groups, and the regional interests contribute to the complexity.¹⁸⁸

Although the Reagan Administration continued to adhere to its strategy of "research before action,"¹⁸⁹ and Congress rejected proposals for more stringent domestic legislation,¹⁹⁰ Canada went forward with its own legislation. In 1984, Canada implemented control strategies aimed at reducing sulphur dioxide emissions in its seven easternmost provinces by 50 percent of 1980 levels by 1994.¹⁹¹ A year later,

181. Moller, *supra* note 73, at 1213. Negotiations with the Canadian government in the late 1970s was part of the Carter Administration's extensive environmental program. *Id.*

182. FRIENDLY NEIGHBORS, *supra* note 1, at 67; MARSHALL E. WILCHER, THE POLITICS OF ACID RAIN: POLICY IN CANADA, GREAT BRITAIN AND THE UNITED STATES 62 (1989). This position was maintained despite the call for immediate action by a panel of scientists supported by the White House. *Id.* at 62.

183. WETSTONE & ROSENCRANZ, *supra* note 11, at 125-26.

184. Moller, *supra* note 73, at 1212.

185. *Id.* The United States has been estimated to produce approximately 10 times as much nitrogen oxide as Canada and approximately 5.5 times as much sulfur dioxide. *Id.* at 1212 (citing SUBCOMMITTEE ON ACID RAIN OF THE STANDING COMMITTEE ON FISHERIES AND FORESTRY, 97TH CONG., 1ST SESS., STILL WATER: REPORT OF THE SUBCOMMITTEE 35-36 (1981)). It has also been estimated that three to four times as much sulphur dioxide moves across the border from the United States to Canada than moves in the opposite direction. *See supra* note 25 and accompanying text.

186. Moller, *supra* note 73, at 1212. The costs of cleaning pollutants from metal smelters, Canada's largest polluting industry, are much less than the costs of cleaning coal-fired power facilities, the largest source of pollution in the United States. *Id.*

187. WILCHER, *supra* note 182, at 61.

188. *Id.* The Reagan Administration had some very influential supporters in Congress for its "caution before action" position. *Id.* at 63.

189. FRIENDLY NEIGHBORS, *supra* note 1, at 69.

190. *See* WILCHER, *supra* note 182, at 64-65.

191. REGENS & RYCROFT, *supra* note 4, at 150. The United States rejected Canadian proposals for an agreement calling for similar reductions in the United States. FRIENDLY NEIGHBORS, *supra* note 1, at 68.

Canada announced measures to toughen automobile emission standards.¹⁹²

D. Special Envoys on Acid Rain

In 1985, President Reagan and Prime Minister Mulroney finally agreed on cooperative action and appointed two special envoys to review the problem of acid rain.¹⁹³ A year later the special envoys concluded that acid rain was indeed a serious transboundary problem,¹⁹⁴ and called for a \$5 billion commitment from the United States to develop new clean coal technologies to abate acid rain.¹⁹⁵ Although Reagan requested the \$5 billion from Congress, the Canadians asserted that the request alone was insufficient to implement the terms of the envoys' report.¹⁹⁶

The Reagan administration continued to drag its feet. Not until the Bush Administration took over in 1989 were substantive domestic controls implemented and the foundation laid for a bilateral agreement.

E. 1990 Amendments to the United States Clean Air Act: Providing the Foundation for a Bilateral Agreement

The 1990 Clean Air Act Amendments¹⁹⁷ provided the foundation for a bilateral agreement with Canada on long-range transboundary air pollution. Title IV of the 1990 amendments adds a complex new program to reduce acid deposition that applies to coal-fired electric utilities.¹⁹⁸ The program is intended to limit sulphur dioxide emissions from utilities to 8.9 million tons annually by the year 2000,¹⁹⁹ a reduction of ten million tons from the 1980 level.²⁰⁰ The program is based on a system of sulphur dioxide emissions allowances that utilities can bank or sell to

192. REGENS & RYCROFT, *supra* note 4, at 150. Canada also signed the 1985 Protocol to Reduce Sulfur Dioxide Emissions, which the United States refused to sign. *Id.* at 151.

193. The appointees were Drew Lewis, former Secretary of Transportation, and William Davis, former Premier of Ontario. FRIENDLY NEIGHBORS, *supra* note 1, at 70.

194. DREW LEWIS & WILLIAM DAVIS, JOINT REPORT OF THE SPECIAL ENVOYS ON ACID RAIN 6 (1986). See FRIENDLY NEIGHBORS, *supra* note 1, at 70-72.

195. REGENS & RYCROFT, *supra* note 4, at 152; FRIENDLY NEIGHBORS, *supra* note 1, at 71.

196. FRIENDLY NEIGHBORS, *supra* note 1, at 71-72.

197. 1990 Clean Air Act Amendments, Pub. L. No. 101-549, 104 Stat. 2399. Canada was a major actor in lobbying for the acid rain controls established in these amendments. WILCHER, *supra* note 182, at 70.

198. 1990 Clean Air Act Amendments, Pub. L. No. 101-549, Title IV, §§ 401-416, 104 Stat. 2584-2634. Coal-fired electric utilities are the major source of sulfur dioxide emissions in the United States, and the largest contributor to the acid rain problem. See *supra* note 11 and accompanying text.

199. 1990 Clean Air Act Amendments, Pub. L. No. 101-549, § 403, 104 Stat. 2589 (42 U.S.C. § 7651(b) (Supp. II 1990)).

200. *Id.* § 401(b), 104 Stat. 2584 (42 U.S.C. § 7651(b) (Supp. II 1990)). The emission reductions will be implemented in two phases. Phase I commences on January 1, 1995 and imposes controls on the 110 highest emitting utility plants. Phase II, which begins in the year 2000, extends the acid rain program to virtually all remaining plants and new plants, with the goal of achieving a permanent national cap of 8.95 million tons of sulphur dioxide emissions annually for electric utilities. *Id.*

other emitters in an emissions trading program.²⁰¹ Theoretically, this system will increase the efficiency of pollution abatement by encouraging those polluters who can abate emissions most cheaply to do so, while at the same time holding total pollution at a given level.²⁰²

The 1990 amendments also proposed to reduce nitrogen oxide emission levels by 2 million tons from the 1980 level.²⁰³ The amendments establish standards 60 percent lower than previous standards for gasoline-powered automobiles,²⁰⁴ and authorize the EPA Administrator to establish standards twice as stringent if they are found to be necessary, technologically feasible, and cost-effective.²⁰⁵ They also establish clean fuel and clean-fueled vehicle programs, including a pilot program in California which requires the production of significant numbers of clean-fueled vehicles by 1999²⁰⁶ and a similar program for fleet vehicles in the most heavily polluted areas.²⁰⁷

While these amendments fall short of the recommendations made by many groups, they are a vast improvement over previous domestic efforts to address the problem.²⁰⁸ More significantly, they officially recognize that acid rain "represents a threat to natural resources, ecosystems, materials, visibility, and public health," that it is a problem of "international significance," that reductions in sulphur dioxide and nitrogen dioxide emissions would curb acid rain, that technology is currently available to control these emissions, and that delaying such remedies would adversely affect current and future generations.²⁰⁹ By recognizing the intricate problems of acid rain, these amendments

201. 1990 Clean Air Act Amendments, Pub. L. No. 101-549, § 403, 104 Stat. 2589 (42 U.S.C. § 7651(b)). An "allowance" is an "authorization, allocated to an affected unit by the Administrator [of the EPA] . . . to emit, during or after a specified calendar year, one ton of sulfur dioxide." *Id.* § 402, 104 Stat. 2585 (42 U.S.C. § 7651(a)).

202. Gallob, *supra* note 76, at 134. A polluter with cheap abatement costs may, for example, clean up beyond the Act's requirements and recover these costs and possibly make a profit by selling these unused allowances. Presumably, a polluter that faces abatement costs that are higher than the cost of these allowances will be the buyer of these excess allowances. Thus, the pollution emission level will be capped and the abatement will be achieved by those polluters that can do so most cheaply.

203. 1990 Clean Air Act Amendments, Pub. L. No. 101-549, § 401, 104 Stat. 2584 (42 U.S.C. § 7651).

204. The nitrogen oxide standard was lowered from 1.0 to 0.4 grams per vehicle mile. *Id.* § 202(g)(1), 104 Stat. 2474 (42 U.S.C. § 7521(g)(1)); Gallob, *supra* note 76, at 134. This standard was to be met by 40 percent of the vehicles by the 1994 model year, 80 percent by 1995 and 100 percent by 1996. 1990 Clean Air Act Amendments, Pub. L. No. 101-549, § 202(g)(1), 104 Stat. 2474 (42 U.S.C. § 7521(g)(1)).

205. 1990 Clean Air Act Amendments, Pub. L. No. 101-549, § 202(i), 104 Stat. 2476 (42 U.S.C. § 7521(i)).

206. *Id.* § 249, 104 Stat. 2525 (42 U.S.C. § 7589).

207. *Id.* § 246, 104 Stat. 2520 (42 U.S.C. § 7586).

208. The National Academy of Sciences recommended twelve million ton sulphur dioxide and four million ton nitrogen oxide reductions. *Clean Air Act Amendments of 1989: Hearings on H.R. 3030 Before the Subcomm. on Environmental Protection of the Senate Comm. on Environment and Public Works*, 101st Cong., 1st Sess. 470 (1989) (statement by the American Planning Association).

209. 1990 Clean Air Act Amendments, Pub. L. No. 101-549, § 401, 104 Stat. 2584 (42 U.S.C. § 7651).

became the foundation for a bilateral agreement with Canada on transboundary air pollution.

IV. 1991 Canada-United States Agreement on Air Quality

On March 13, 1991, President Bush and Prime Minister Mulroney signed the long awaited bilateral Agreement on Air Quality ("Agreement" or "Air Quality Agreement").²¹⁰

A. Reaffirmation of Principles of State External Responsibility

In the Agreement, the parties reiterated their adherence to the international principle of external responsibility in the environmental context.²¹¹ The parties also reaffirmed their commitment to Principle 21 of the Stockholm Declaration.²¹² By doing so, the United States and Canada strengthened their commitment to the international principle of external responsibility, thereby relinquishing certain rights under the international principle of state sovereignty.²¹³

B. Beyond the Current Acid Rain Problem

The Agreement goes beyond addressing the current acid rain problem. The stated objective is to control all types of transboundary air pollution between the two countries, with the exception of those having global effects, such as ozone depletion.²¹⁴ The Agreement defines air pollution and transboundary air pollution in essentially the same way these terms were defined in the 1979 ECE Convention on Long-Range Transboundary Air Pollution;²¹⁵ the only real difference is that the Agreement excludes pollutants having global effects.²¹⁶ Under the Agreement, the

210. Agreement on Air Quality, Mar. 13, 1991, U.S.-Can., 30 I.L.M. 676 (1991) [hereinafter Air Quality Agreement].

211. See *supra* notes 89-90 and accompanying text.

212. See *supra* note 90 and accompanying text. In this Principle, the parties acknowledged many of their past efforts to resolve transboundary pollution problems. These included the Boundary Waters Treaty of 1909, *supra* note 44; the Trail Smelter Arbitration of 1941, *supra* note 44; the Great Lakes Water Quality Agreement of 1978, as amended, *supra* note 44; the Memorandum of Intent of 1980, *supra* note 176; the 1986 JOINT REPORT OF THE SPECIAL ENVOYS ON ACID RAIN, *supra* note 194; the ECE Convention on Long-Range Transboundary Air Pollution of 1979, *supra* note 3; and the Air Quality Agreement, *supra* note 210, at 1.

213. See *supra* note 90.

214. Air Quality Agreement, *supra* note 210, art. I(2).

215. ECE Convention, *supra* note 3.

216. Air Quality Agreement, *supra* note 210, Introduction and art. I. The Agreement defines "air pollution" as "the introduction by man, directly or indirectly, of substances into the air resulting in deleterious effects of such a nature as to endanger human health, harm living resources and ecosystems and material property and impair or interfere with amenities and other legitimate uses of the environment." *Id.* art. I.

The Air Quality Agreement defines "transboundary air pollution" as "air pollution whose physical origin is situated wholly or in part within the area under the jurisdiction of one Party and which has adverse effects, other than effects of a global nature, in the area under the jurisdiction of the other Party." *Id.*

United States and Canada agreed to "establish specific objectives . . . for emissions limitations of such air pollutants as the Parties agree to address."²¹⁷ To date, the Agreement contains provisions regarding sulphur dioxide and nitrogen oxide emissions, as well as on the prevention of significant deterioration and visibility protection.²¹⁸ Nevertheless, by keeping the scope of the Agreement broad, the parties have established a framework to resolve other troublesome areas of trans-boundary air pollution such as urban smog.²¹⁹

C. Specific Objectives for the Emissions Limitations of Sulphur Dioxide and Nitrogen Oxides

Annex 1 of the Agreement contains each country's specific objectives for emissions limitations of sulphur dioxide and nitrogen oxides.²²⁰ The United States has committed itself to the sulphur dioxide and nitrogen oxide emission control programs established under the 1990 Clean Air Act Amendments discussed above.²²¹

Canada has agreed to continue its commitment to reduce its sulphur dioxide emission levels in the seven eastern-most provinces to 2.3 million metric tons per year by 1994.²²² In addition, Canada committed itself to the achievement of a permanent national cap on sulphur dioxide emissions of 3.2 million metric tons per year by 2000.²²³ As for nitrogen oxide emissions, Canada agreed to develop more stringent controls on nitrogen oxide emissions on stationary sources.²²⁴ Canada also agreed to impose emissions limitations on mobile sources which closely correlate to those under the 1990 Amendments to the United States Clean Air Act.²²⁵ The United States and Canada have also made commitments to add more stringent sulphur dioxide and nitrogen oxide emission limitations than are required by the ECE Convention, its Protocols, and any other agreement to which they are parties.²²⁶

D. Assessment, Notification, and Mitigation

The assessment, notification, and mitigation provisions of the Air Quality Agreement are more comprehensive than similar provisions of the Memorandum of Intent and the ECE Convention.²²⁷ These provisions

217. Air Quality Agreement, *supra* note 210, art. IV(1).

218. *Id.* annex 1.

219. Work is already under way in Canada on an urban smog annex to the Agreement. *Air Quality Accord Between U.S., Canada Sets Framework to Resolve Future Issues*, 14 INT'L ENVTL. REP. (BNA) 127 (1991).

220. *Id.* annex 1.

221. *See supra* notes 204-14 and accompanying text.

222. Air Quality Agreement, *supra* note 210, annex 1. One metric tonne is equal to 1.1 tons.

223. *Id.*

224. *Id.*

225. *Id.*; 1990 Clean Air Act Amendments, *supra* note 128.

226. *See, e.g.*, ECE Convention, *supra* note 3.

227. Air Quality Agreement, *supra* note 210, art. V; ECE Convention, *supra* note 3, art 5. These provisions are also more comprehensive than those found in the Bound-

may help to provide each country with better guidance in their actions and decisions than did previous international agreements.

The ECE Convention merely provides that both the United States and Canada shall engage in consultations, upon request, if one of the parties is actually exposed to a "significant risk of long-range transboundary air pollution."²²⁸ The Air Quality Agreement goes further by explicitly requiring each party to initially assess any proposed activities and projects within its jurisdiction which, if carried out, "would be likely to cause significant transboundary air pollution."²²⁹

The Agreement requires that each party notify the other in advance of any decisions concerning them.²³⁰ The Agreement also mandates consultation, at the request of either party, concerning such proposals²³¹ as well as any changes in either country's laws, regulations, or policies that "would be likely to affect significantly transboundary air pollution."²³²

These consultations must commence "as soon as practicable, but in any event not later than thirty days from the date of receipt of the request for consultation, unless otherwise agreed by the Parties,"²³³ and must include consideration of appropriate mitigation measures.²³⁴ If, after consultation, an issue remains unresolved, the Agreement mandates that the parties refer the matter to an "appropriate third party" in accordance with agreed terms of reference.²³⁵

One weakness of these provisions is that there is a lingering ambiguity as to what constitutes "significant transboundary air pollution." This ambiguity leaves each nation with broad discretion in making the determination as to whether a particular proposed or continuing action should be subject to the assessment, notification, and mitigation requirements. This problem may not, however, be as critical in the context of this bilateral agreement as it has been with previous multilateral

ary Waters Treaty, *supra* note 44, and the Great Lakes Water Quality Agreement, *supra* note 44.

228. ECE Convention, *supra* note 3, art. 5.

229. Air Quality Agreement, *supra* note 210, art. V(1).

230. Air Quality Agreement, *supra* note 210, art. V. Art. V(1) requires that "[e]ach party shall . . . assess those proposed actions, activities and projects within [its jurisdiction] that if carried out would be likely to cause significant transboundary air pollution, including consideration of appropriate mitigation measures." *Id.*

231. *Id.* art. X. The 1909 Boundary Waters Treaty required prior approval by the IJC for uses, obstructions or diversions of boundary waters which affected the flow or level of the other nation's water. Boundary Waters Treaty, *supra* note 44, arts. III, IV and VII. Air Quality Agreement, *supra* note 210, art. V(3). The ECE Convention similarly requires consultations, upon request.

232. Air Quality Agreement, *supra* note 210, art. V(2), (3).

233. *Id.* art. XI.

234. *Id.* art. V(4). Appropriate mitigation measures are required to be taken for any covered actions, activities or projects. *Id.* art. V(5).

235. *Id.* art. XII. It can be assumed that this referral provision is a reflection of the type of action taken in the Trail Smelter Case, discussed *supra* notes 74-89 and accompanying text, where the Parties picked a three member arbitration tribunal to settle its dispute.

agreements because such determinations are more easily monitored where only two countries are involved, especially where the relationship is as close as that between the United States and Canada. This problem is also mitigated to a degree by the exchange of information provisions and the general framework set up by the Agreement in which the parties can negotiate and agree on more particular standards.

E. Coordinated Activities in the Context of Scientific and Technical Activities and Economic Research

The mandates of the Air Quality Agreement concerning scientific and technical activities, as well as economic research, also go farther than similar provisions found in the Memorandum of Intent and the ECE Convention. In the Agreement, the United States and Canada agreed to coordinate their monitoring activities through the "coordination of existing networks . . . additions of monitoring tasks of existing networks . . . addition of stations or networks where no existing monitoring facility can perform [the] necessary function . . . the use of compatible data management procedures, formats and methods . . . [and] the exchange of monitoring information."²³⁶ Furthermore, it provides for the exchange of information or various monitoring, research, development, and analytical activities.²³⁷

Such coordinated activities will lead to a better understanding of transboundary air pollution problems faster than individual efforts. The knowledge generated will alleviate many of the issues related to causation. For example, these efforts may lead to better tracking technologies and models that would allow a court to assess the liability of particular polluters. More agreement over the effects of a particular state's pollution activities may prompt the EPA Administrator to utilize section 115 of the Clean Air Act to change a state's pollution program in response to the transboundary damage in Canada.

As with most affirmative programs, these coordination provisions will involve costs for each party. It is arguable, however, that the total costs will be lower than one might expect. Costs may be saved because one nation's efforts will not be duplicated in the other nation. A better understanding of transboundary air pollution will enable both nations to better attune their environmental policies to the actual effects of transboundary air pollution. Most importantly, these efforts and the knowledge acquired through them will aid in developing cheaper, more efficient ways to curb pollution. If both countries exercise good faith in

236. Air Quality Agreement, *supra* note 210, annex 2. The Memorandum of Intent speaks very little to monitoring activities. Memorandum of Intent, *supra* note 176. The ECE Convention speaks of the "desirability" and the "need" for such coordinated activities as those agreed upon in the Air Quality Agreement. ECE Convention, *supra* note 3.

237. Air Quality Agreement, *supra* note 210, annex 2. The ECE Convention was comparably thorough with respect to the cooperation of the parties in the context of research, development and economic assessments. ECE Convention, *supra* note 3, art. 7.

their dealings, these coordinated activities could prove very effective in addressing transboundary air pollution problems.

F. Review and Assessment Program

One of the most significant aspects of the Air Quality Agreement is the establishment of an advanced program to review and assess the progress made in the implementation of the Agreement. This program includes the involvement of a bilateral Air Quality Committee, set up under the Agreement,²³⁸ the International Joint Commission, both the United States and Canada, and the public.²³⁹ It also establishes a schedule for reviewing progress made in the implementation of the Agreement, including time limits for consultations between the parties.²⁴⁰

Such a comprehensive review program was absent from previous international agreements addressing transboundary air pollution. The ECE Convention merely directed the established Executive Body to "review the implementation of the present Convention," and to "establish as appropriate, working groups to consider matters related to the implementation and development of the present Convention . . ."²⁴¹ The subsequent protocols to the ECE Convention provided merely that: "The parties shall regularly review the present Protocol, taking into account the best available scientific substantiation and technological development," and added that the first review take place within the first year after the date of entry into force.²⁴²

Under the Air Quality Agreement, the United States and Canada agreed to establish a bilateral Air Quality Committee, composed of an equal number of members representing each Party.²⁴³ The Committee has the responsibility for preparing progress reports every two years.²⁴⁴ The Agreement directs that these reports be submitted to both countries and the International Joint Commission, and then released to the public.

The Agreement gave the International Joint Commission the responsibility of inviting comments on the reports, "including through public hearings," and of compiling a record and preparing a synthesis of

238. Air Quality Agreement, *supra* note 210, art. VIII.

239. No other agreements concerning transboundary pollution of any form, to which the United States and Canada are parties, requires public participation in reviewing and assessing progress made in the implementation of the agreement. *See, e.g.,* Boundary Waters Treaty, *supra* note 44; Water Quality Agreement, *supra* note 44 (authorizes the IJC to conduct public hearings at its discretion); ECE Convention, *supra* note 3.

240. Air Quality Agreement, *supra* note 210, arts. X and XI.

241. ECE Convention, *supra* note 3, art. 10.

242. *See, e.g.,* 1988 Protocol, *supra* note 123, art. 5. This task was indeed accomplished. PROGRESS REPORT, *supra* note 16.

243. Air Quality Agreement, *supra* note 210, art. VIII. A similar committee, the Water Quality Committee, was established under Article VIII of the Water Quality Agreement, *supra* note 44, art. VIII.

244. Air Quality Agreement, *supra* note 210, art. VIII(a), (b).

the comments presented on each report.²⁴⁵ The Agreement requires that the record and synthesis then be submitted to the parties and released to the public.²⁴⁶ This may pose some time costs, but such costs are outweighed by the benefits of public participation and oversight in the implementation of the Agreement.

One of the most significant improvements in this context over past agreements is the mandatory consultation requirement on the contents of these reports. The Agreement mandates that these consultations take place "as soon as practicable, but in any event not later than thirty days from the date of receipt of the request for consultations, unless otherwise agreed by the Parties."²⁴⁷ Consultations are mandatory, and not triggered only when a party requests them.²⁴⁸ Another advantage is the requirement that the United States and Canada conduct a "comprehensive review and assessment" of the Agreement every five years.²⁴⁹

The elaborate review and assessment process established in the Air Quality Agreement ensures a forum for all viewpoints. This forum should create better solutions to the controversial issues involved in transboundary air pollution disputes. In fact, the Agreement also requires the parties to consult with "State or Provincial Governments, interested organizations, and the public," when appropriate, in implementing the agreement.²⁵⁰

By providing schedules and time limits, the Agreement ensures that action, at least in the form of bilateral consultations, will be taken within reasonable time limits. As such, the agreement provides a means by which each party, as well as each party's state or provincial governments, citizens, and interest groups, can exert substantial pressure on the other party to implement and effectuate the objectives of the agreement.

G. Consultations, Referrals, and Settlement of Disputes

The referral and dispute resolution provisions of the Agreement are also more elaborate and promise to be more effective in resolving disputes than have past agreements between Canada and the United States regarding transboundary pollution.²⁵¹

If the parties are unable to resolve certain issues or disputes, the Agreement provides two means of settlement. For issues that remain unresolved after consultation, the Agreement provides that the parties shall "refer the matter to an appropriate third party"²⁵²

245. *Id.* art. IX(1).

246. *Id.* art. IX(1).

247. *Id.* art. XI.

248. *Id.* art. X.

249. *Id.* art. X.

250. *Id.* art. XIV.

251. *Id.* arts. XI, XII and XIII.

252. *Id.* art. XII. The Agreement does not elaborate on who may be an "appropriate third party." *Id.*

For disputes arising over the "interpretation or the implementation" of the agreement, a separate process applies. For these disputes, the Agreement directs the parties, "after consultations," to commence negotiations to resolve the disputes, "as soon as practicable, but in any event not later than ninety days . . . unless otherwise agreed by the Parties."²⁵³ If the parties fail to resolve the dispute by negotiations, they must consider whether to submit the dispute to the International Joint Commission or to "another agreed form of dispute resolution."²⁵⁴

The Agreement also provides that the parties may refer to the International Joint Commission ("IJC") any other matters "as may be appropriate for the effective implementation of this Agreement."²⁵⁵ The Agreement does not extend any new powers to the IJC.²⁵⁶ Nevertheless, it does confirm that the IJC's jurisdiction extends to air pollution not having a significant effect on the Great Lakes or other boundary waters.²⁵⁷

By comparison, the ECE Convention and its Protocols merely provide that "[i]f a dispute arises . . . as to the interpretation or application of the Convention, [the parties] shall seek a solution by negotiation or by any other method of dispute settlement acceptable to the parties to the dispute."²⁵⁸ The ECE Convention gives little guidance to the parties on how to approach unresolved issues and disputes. The ECE Convention imposes no requirements for consultation prior to negotiations concerning such disputes. Furthermore, it places no time limits on when any consultations or negotiations must be commenced.

One arguably major weakness of the Agreement in the context of dispute resolution is that it does not appear to establish any clear enforcement procedures that would give the parties a remedy for breach, other than negotiation or withdrawal. The Agreement merely provides that if the parties do not resolve issues through negotiation, they shall consider whether to submit that dispute to the IJC. If they decide not to take that route, "they shall, at the request of either Party,

253. *Id.* art. XIII(1).

254. *Id.* art. VIII(2). The *Trail Smelter* Case, discussed *supra* notes 74-86 and accompanying text, is one example of an alternative form of dispute resolution, where the United States and Canada agreed to have the transboundary air pollution issues decided by a three member arbitration tribunal. See Cagann, *supra* note 89, at 180.

255. Air Quality Agreement, *supra* note 210, art. IX. Similar provisions can be found in the 1909 Boundary Waters Treaty, *supra* note 44, art. IX and the Great Lakes Water Quality Agreement, *supra* note 44, art. VII.

256. Prior to the Air Quality Agreement, virtually any matter arising between the two countries could be the subject of a "reference" to the IJC. FRIENDLY NEIGHBORS, *supra* note 1, at 193.

257. The Water Quality Agreement gave the IJC jurisdiction over air pollution problems that have "significant adverse effects on environmental quality." Water Quality Agreement, *supra* note 44, art. VI(1)(l). This provision may be interpreted to extend the IJC's jurisdiction only over air pollution problems affecting the Great Lakes. See *supra* notes 71-73 and accompanying text.

258. ECE Convention, *supra* note 3, art. 13.

submit the dispute to another agreed form of dispute resolution.”²⁵⁹ The Agreement does not impose on the parties an obligation to submit these disputes to any binding court or tribunal.²⁶⁰ Commentators have criticized past agreements between the United States and Canada for limiting the IJC’s powers only to those matters brought to it through the reference process.²⁶¹ The Agreement would no doubt be a more effective agreement had the IJC or some other bilateral organization been given initiating and binding powers, but it is questionable whether such a provision would have been, or will be in the near future, politically acceptable.²⁶²

This weakness is mitigated, however, by the mandatory negotiation provisions. By imposing consultation and negotiation requirements, and by placing specific time limits on when these undertakings must be commenced, the Air Quality Agreement assures that bilateral efforts to resolve disputes will commence within a reasonable time period. Furthermore, some have characterized the reference process as an effective means for settling disputes and addressing transboundary pollution problems.²⁶³ Admittedly, however, these provisions may not be adequate to resolve many of the problems that may arise in the area of transboundary air pollution.

V. Progress and Implementation Overview

The Canada-United States Air Quality Committee, established under the Agreement, met for the first time on November 26, 1991, in Washington, D.C.²⁶⁴ In order to assist in carrying out the terms of the Agreement, the committee set up two subcommittees.²⁶⁵ One subcommittee is responsible for overseeing the implementation of the Agreement and works on such issues as emission inventories, control technologies, and market-based mechanisms.²⁶⁶ The other subcommittee’s focus is on sci-

259. Air Quality Agreement, *supra* note 210, art. XIII(2).

260. Many treaties employ binding third party dispute resolution mechanisms. For example, the United States-Canada Free Trade Agreement provides for a binding arbitration tribunal. Moller, *supra* note 73, at 1239. The nations, however, explicitly decided not to extend the tribunal’s jurisdiction over acid rain issues. *Id.*

261. See *supra* notes 53-61 and accompanying text; FRIENDLY NEIGHBORS, *supra* note 1, at 197.

262. See Moller, *supra* note 73, at 1234-35 (proposing that the IJC could be an effective administrator of an air quality agreement between Canada and the United States, but points to the view of commentators who argue that “to extend the powers of the IJC to include air pollution would dangerously weaken its ability to operate effectively”). Assuming that an independent body would achieve higher enforcement levels than domestic agencies, an increase in litigation and cleanup costs can be expected. One could expect, therefore, these industrial polluters to engage in a tremendous lobbying effort against giving an independent body such enforcement powers.

263. See FRIENDLY NEIGHBORS, *supra* note 1, at 197.

264. PROGRESS REPORT, *supra* note 16, at 9.

265. *Id.* at 1.

266. *Id.*

entific and technical activities.²⁶⁷

Canadian sulphur dioxide emissions in Eastern Canada are already within about sixteen percent of the Agreement's 1994 target of 2.3 million metric tonnes.²⁶⁸ Sulphur dioxide emissions nationally in Canada have come within about 20 percent of the Agreement's target of 3.2 million metric tonnes.²⁶⁹ As for nitrogen oxide emissions in Canada, a reduction program is being formalized through the use of federal-provincial agreements.²⁷⁰

The United States has been slower in implementing the acid rain provisions of the Clean Air Act and the requirements of Annex 1 of the Air Quality Agreement. To its credit, in December, 1991, the United States EPA finalized its first rules governing the auction and sale of allowances under the acid rain program.²⁷¹ However, it was not until January 11, 1993 that the EPA promulgated its final rule regarding four other areas of critical importance to the acid rain program: acid rain permits, sulphur dioxide allowances, continuous emissions monitoring and excess emissions penalties.²⁷² As for reductions in nitrogen oxide emissions, regulations implementing the mobile source provisions of the Clean Air Act and the Air Quality Agreement were promulgated in June 1991.²⁷³ Rules to implement the nitrogen oxide emission requirements of the acid rain control program of the Clean Air Act are being developed.²⁷⁴

Apart from the development and initiation of each party's domestic programs to meet the Agreement's terms, the primary bilateral activities have occurred in the scientific and technical areas, including a sharing of ideas and research regarding emission inventories, atmospheric modeling, deposition monitoring, control technologies and market-based incentives to help reduce the cost of emission reductions.²⁷⁵ Most importantly at this stage, the parties have taken advantage of the Agreement's framework by freely exchanging people and information. Since the inception of the Agreement, "the number of contacts and degree of

267. *Id.*

268. *Id.* at 17.

269. *Id.* Sulphur dioxide emissions nationally in Canada had declined from 4.6 million metric tonnes in 1980 to 3.5 million metric tonnes in 1990. *Id.* Canada is currently developing a program to maintain a national cap of 3.2 million metric tonnes per year by the end of 1999. *Id.*

270. *Id.* at 21.

271. *Id.* at 19.

272. 58 Fed. Reg. 3590-01, Jan. 11, 1993 (EPA) (see text under "Acid Rain Rulemaking Overview").

273. PROGRESS REPORT, *supra* note 16, at 22.

274. *Id.*; see 57 Fed. Reg. 55632-01, Nov. 25, 1992 (EPA Proposed Rule). Representative Henry A. Waxman, a Californian Democrat, and the Sierra Club filed a lawsuit against the EPA for missing statutory deadlines for issuing regulations implementing the Clean Air Act. *EPA Settles Clean Air Rule Lawsuit*, UTILITY ENVIRONMENT REPORT 16 (Dec. 11, 1992). Under the resulting settlement agreement, the EPA agreed to issue final rules on nitrogen oxide controls in the acid rain program by October 30, 1993. *Id.*

275. *Id.*

cooperation and exchange of information has increased significantly, to the benefit of both countries.²⁷⁶

Generally, "progress has been made by each country, individually and together. A forum for discussion has been established; programs to resolve domestic and transboundary air quality issues are being developed, and information about them is being shared; lessons learned from existing and past programs also are being shared; and the pursuit of data compatibility between countries is under way."²⁷⁷ There is no reason to believe that progress will ease under the administration of the newly elected United States President, Bill Clinton. In fact, one may forecast that, under the guidance of Vice President Al Gore, a well-known advocate for environmental causes, and the newly appointed Administrator of the United States Environmental Protection Agency, Carol Browner, the new administration will pursue the goals and terms of the Agreement with renewed vigor.²⁷⁸

Conclusion

The Air Quality Agreement is a vast improvement over past attempts to address transboundary air pollution problems. The Agreement strengthens the international principle of external responsibility in the environmental context and establishes an effective bilateral framework for addressing the problem of transboundary air pollution.

The assessment, notification, and mitigation provisions, coupled with consultation requirements, provide each country with the means to effectively influence domestic activities of the other country. Provisions requiring coordinated activities in the context of scientific and technical activities, and economic research, promise to accelerate our knowledge of transboundary air pollution problems and the development of methods for handling them.

The Agreement's review and assessment provisions, coupled with mandatory negotiation and consultation requirements, create a means for ensuring that the Agreement is implemented effectively. The Agreement exposes the review process to the public eye and places time limits on the commencement of negotiations and consultations. These provisions counteract the negative consequences, such as delay tactics and bad faith activities, that could result from the Agreement's lack of independent enforcement mechanisms.

276. *Id.*

277. PROGRESS REPORT, *supra* note 16, at 1.

278. Carol Browner previously worked with Al Gore, helped draft the 1990 Clean Air Act Amendments, and has already indicated that meeting Clean Air Act rule-making deadlines will be a priority. *Storm-tested Browner 'Plenty Tough' for Job*, USA TODAY, Jan. 8, 1993, at 9A. As stated by Sierra Club Chairman J. Michael McCloskey, "Carol Browner's appointment is a breath of fresh air after twelve years of choking smog." *Sierra Club Applauds Choice of Browner to Head EPA*, BUSINESS WIRE, Dec. 11, 1992, available in LEXIS, Nexis Library, Wires File.

Overall, the Agreement is a vast improvement over past bilateral and multilateral efforts to confront transboundary air pollution issues. The Agreement did not set out to resolve the issues in one stroke of a pen. Rather, as is indicated by the progress made since the Agreement's inception, it has sought to establish an effective framework in which to bilaterally address present and future transboundary air pollution problems between the United States and Canada.

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