

Long-range Trans-boundary Air Pollution

By

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INTRODUCTION

In the summer of 1988, I was ten years old and remember very clearly playing baseball with my friends in the neighbor's yard. I had just got a hit and as I headed into second base, white flakes began to fall out of the sky. Initially I thought it was snowing, but I quickly realized two things first, it was the middle of the summer and no matter how unpredictable South Dakota weather might be, it was unlikely to be snowing. Second, the white flakes weren't cold, in fact the flakes simply crumbled in my hand before the wind would blow them away again. I later learned that these white flakes were ash from the fires that were burning out of control in Yellowstone national parks. Whenever the winds shifted in the right direction, this scene was repeated over and over again that summer. That memory has always stayed with me, it was the first time that I realized that the air could pick up a particle and deposit it hundreds, if not thousands, of miles away.

Of course the ash that fell from the sky on that summer afternoon didn't really poses a serious environmental threat. Unfortunately, not all air pollution is as benign as this ash, many air pollutants has long lasting and often detrimental effects on the environment and human health. This realization leads to questions such as, what can be done to prevent this type of pollution in the future, and who should be held legally responsible for the damages that people suffered. While answering those questions is a case such as the ash from the Yellowstone, when the pollutant originates within one

country and is deposited back within the same country can be comparatively simple. Controlling and reducing air pollution becomes even more complex when the source of the air pollution is completely within one country and the ending point is within another country. Because it is often difficult if not impossible to determine the exact location that air pollution originated from and it can be equally difficult to determine where air pollution will eventually settle. Because of this difficulty often more traditional forms of tort law can have difficulty holding tortfeasors responsible. Even if polluters could be identified and held responsible, the resulting fines may still not be enough of a deterrent to prevent companies from polluting and certainly would not solve the problem of trans-boundary air pollution and the resulting health and environmental problems.

For these reasons treaty between countries has been the preferred approach to dealing with the trans-boundary air pollution. This paper will address a brief background of trans-boundary air pollution, the pollutants that are of major concern in trans-boundary air pollution context. Part II is an analysis of both the Convention on Long-range Trans-boundary Air Pollution (LRTAP) in Europe and the Bilateral Air Quality Agreement between The United States and Canada. Part III will look at both the European model in the form of LRTAP and the North American model in the form of the Bilateral Air Agreement and consider whether if any of this models could be effective in curbing China's air pollution emissions.

I. BACKGROUND

The origins of trans-boundary boundary air pollution coincide with the emergence of the Industrial Revolution.¹ As the use of technology increased, more and more people abandoned a traditional agricultural life style and sought employment in cities; pollution became a reality of life.² People generally accepted these conditions and the health laws that were past during this period often lacked any enforcement provision that would have allowed people to have any real remedy for such situation.³ While the immediate effect of pollution on human health can be more readily felt, the lasting effects of pollution on the environment and the distances that air pollution could travel were not understood until the 1960s,⁴ when scientists made the connection between sulfur emissions in Central Europe and the Acidification of Scandinavians Lake.⁵

Because the prevailing winds in Europe blow from the southwest, air pollution from Europe's large industrialized countries, such as Germany and England drifted towards the Scandinavian countries and eventually settled into the lakes and streams those countries.⁶ This resulted in an increase of PH levels in many lakes on the Scandinavian Peninsula and had serious detrimental effects on plant and animal life in and around the lakes.⁷ With this realization it became clear that air pollution that was

¹ Eric McLamb, The Industrial Revolution and Its Impact on Our Environment (2008), Available at http://ecology.com/features/industrial_revolution/index.html

² Richard Hooker, The European Enlightenment the industrial revolution (1996), Available at <http://www.wsu.edu/~dee/ENLIGHT/INDUSTRY.HTM>

³ The UK Statute Law Database, Public Health Act (1875) Available at <http://www.statutelaw.gov.uk/content.aspx?activeTextDocId=1180519>

⁴ United Nations Economic Commission for Europe, Convention on Long-range Transboundary Air Pollution, (2009). Available at http://www.unece.org/env/lrtap/lrtap_h1.htm

⁵ Id.

⁶ Sven Erik Jorgensen, Acidification of the Scandinavian Lakes, (page 23-24) Available at http://www.ilec.or.jp/eg/pubs/guideline/chapter/Vol.8_chapter/Vol.8_Chapter2.pdf

⁷ I. P. Muniz, The effect of acidification on Scandinavian freshwater fish fauna, (1984), Available at <http://www.jstor.org/pss/2396102>

being completely produced in one country was having a serious environmental impact inside another country. The question then became what pollutants were causing these environmental problems.

In the case of acidification of the lakes and rivers on the Scandinavian Peninsula the major pollutant that caused the problem were sulfur emissions being placed in the air.⁸ Sulfur dioxides are emitted into the air by a variety of sources, but are predominately produced during the generation of electricity and the combustion of fossil fuels.⁹ Once sulfur dioxides are emitted into the air it can be carried hundreds of miles by the wind, where it interacts with other particulates in the air and forms acid.¹⁰ Once the sulfur forms into acid in the air, it falls back to earth in the form of rain, snow, fog or other forms of precipitation.¹¹ According to the EPA once this acid falls back to the earth “acid rain damages forests and crops, changes the makeup of soil, and makes lakes and streams acidic and unsuitable for fish.”¹² Continued exposure over a long time changes the natural variety of plants and animals in an ecosystem.¹³ Besides the ecological problems caused by sulfur, it can also and does have a devastating effect on the health of people living in the area with large or prolonged exposures. Particularly people with pre-existing respiratory problems such as asthma, and even can result in further complication in people with heart disease.¹⁴ Some studies have even associated the level of sulfur with premature deaths around the world.

⁸ Environmental Protection Agency, Six Common Pollutants, page 1 (2009) available at <http://www.epa.gov/air/sulfurdioxide/>

⁹ Id.

¹⁰ Id.

¹¹ Id.

¹² Id.

¹³ Id.

¹⁴ WHO Regional Office for Europe, Sulfur Dioxide Chapter 7.4, page 1-5 (2000) available at http://www.euro.who.int/document/aic/7_4sulfurdioxide.pdf page 5

Unfortunately sulfur dioxide is not the only air pollutant that causes major problems worldwide. Carbon Dioxide is now considered the largest contributing factor to climate change. Carbon dioxide is emitted through the burning of oil, coal, and gas that is primarily related to the production of electricity.¹⁵ In fact according the EPA electricity generation represents 42% of all man-made carbon dioxide in the United States.¹⁶ Under natural circumstances the environment produces and reclaims carbon dioxide, through the carbon cycle, that keeps carbon levels basically in balance.¹⁷ However, with the introduction of human produced carbon dioxide, the carbon cycle has been overwhelmed and as a result the amount of carbon dioxide in the air has increased resulted in a warming effect on the plant.¹⁸

While the topic of this paper is not global warming it is impossible to addressing the reasons that carbon dioxide is such a concern in the trans-boundary air pollution context without briefly discussing its' effect in the global warming context. Carbon Dioxide is generally accepted as the major driving force behind global warming. As energy from the sun enters the earth atmosphere it's absorb by the earth and then radiated back into the air. Under normal condition green house gasses would trap some of this energy and help warm the surface of the earth. However, with elevated levels of carbon dioxide more of this energy in trapped and it results in an increased temperature on the earth's surface.¹⁹ This process has resulted in an increased temperature of .65 degrees worldwide over the last 50 years. In fact of the twelve hottest years on record eleven

¹⁵ Environmental Protection Agency, greenhouse gas emission, page 1 (2006), available at http://www.epa.gov/climatechange/emissions/co2_human.html

¹⁶ Id.

¹⁷ Id.

¹⁸ Id.

¹⁹ World Health Organization, climate and health, page 1 (2007), available at <http://www.who.int/mediacentre/factsheets/fs266/en/>

have been recorded since 1995 and as a result parts of the world are now seeing increases in droughts and other severe weather.²⁰ What is abundantly clear is that increasing levels of carbon dioxide has created environmental consequences that required something be done to control carbon dioxide levels worldwide.

There's a long list of air pollutants that often makes its way around the earth. There are volatile organic compounds that create ground-level ozone, persistent organic pollutants that have been linked to cancer levels in people, and chlorofluorocarbons that lead to decrease atmospheric ozone that results in greater ultraviolet radiation reaching the earth and increased rates of skin cancer.²¹ In the end what happens is what is sometimes called a "dance of pollution" that results in everyone else breathing in everyone else's pollution.²²

THE 1979 CONVENTION ON LONG RANGE TRANSBOUNDARY AIR POLLUTION

In response to the myriad of problems that were being caused by the pollutants that have been discussed above and due to the close geographic proximity that defines Western Europe, the community of European nations passed the 1979 Geneva Convention on Long Range Trans-boundary Air Pollution (LRTAP).²³ The convention was necessary to give all the countries in Europe an organization was capable of coordinating efforts to reduce the effects of air pollution.²⁴ The initial negotiations led to a thirty-four-nation agreement that outlined basic principles for pollution control and

²⁰ Id

²¹ D. Elsom, Atmospheric Pollution: A Global Problem 369-370 (2d ed. 1992)

²² Jim Lehrer, Tracking Pollution page 1 (Sept. 7, 2004) available at http://www.pbs.org/newshour/bb/environment/july-dec04/pollution_09-07.html

²³ Levy, M.A., Robert O. Keohane, Peter M Hass, Institutions for the Earth: Promoting international environmental protection. page 1 (1992) available at <http://www.ciesin.org/docs/003-001/box2.html>

²⁴ United Nations Economic Commission Europe, Convention on Long-range Transboundary Air Pollution page 1 (2009) Available at http://www.unece.org/env/lrtap/lrtap_h1.htm page 1

reduction efforts.²⁵ This convention was the first international effort to control the harmful effects of air pollution that went into effect in 1983.²⁶

The convention defines air pollution

as the introduction by man, directly or indirectly, of substances or energy 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, and "air pollutants" shall be construed accordingly²⁷

and Long-range trans-boundary 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 at such a distance that it is not generally possible to distinguish the contribution of individual emission sources or groups of sources.²⁸

Interestingly the convention as initially passed didn't call for or require the signatories to meet a certain level of reductions or even set a target date for reduction to occur.²⁹ Instead it only called for countries to "endeavor to limit and as far as possible, gradually reduce and prevent air pollution including long-range

²⁵ Id.

²⁶ Id.

²⁷ 1979 Convention on Long-Range Transboundary Air Pollution, Air pollution, Art. 1, 1983, Available at <http://www.unece.org/env/lrtap/full%20text/1979.CLRTAP.e.pdf>

²⁸ Id.

²⁹ AirClim, The Convention on Long-range Transboundary Air Pollution, 2003, Available at <http://www.airclim.org/factsheets/clrtap.htm> page 1

air pollution.”³⁰ The convention calls for the parties to “develop the best policy and strategies” and “use the best available technology that is economically feasible” in order to reduce air pollution emissions.³¹

This may seem like a toothless series of agreements that allowed the parties pursue their own ends while taking minimal steps towards preventing and reducing air pollution. However, this may have proved to have been a wise course of action. By setting a very flexible basic agreement that the a large number of countries with diverse background, and different levels of pollution could agree to, it laid a foundation for future agreements that could have much stricter standards and target levels of reductions.

In fact this is exactly what happened. The convention was first passed was primarily designed to reduce sulfur emission and to commence studies in an effort to better understand the effects of long-range trans-boundary air pollution.³² This was followed by a series of protocols that placed increasingly stricter standards and set mandatory levels on reductions.³³ In 1985 the first protocol to LRTAP designed to set a specific reduction targets was passed.³⁴ This protocol called for the signing countries to reduce their sulfur emission by thirty percent by 1993, using 1980 as a baseline.³⁵ Even though Spain, Great Britain and Poland didn't sign on

³⁰ 1979 Convention on Long-Range Transboundary Air Pollution, Air pollution, Art. 2, 1983, Available at <http://www.unece.org/env/lrtap/full%20text/1979.CLRTAP.e.pdf>

³¹ 1979 Convention on Long-Range Transboundary Air Pollution, Air pollution, Art. 6, 1983, Available at <http://www.unece.org/env/lrtap/full%20text/1979.CLRTAP.e.pdf>

³² 1979 Convention on Long-Range Transboundary Air Pollution, Air pollution, Art. 1, 1983, Available at <http://www.unece.org/env/lrtap/full%20text/1979.CLRTAP.e.pdf>

³³ http://www.unece.org/env/lrtap/status/lrtap_s.htm page 1

³⁴ Id

³⁵ AirClim, The Convention on Long-range Transboundary Air Pollution, (2003) Available at http://www.airclim.org/factsheets/clrtap.htm#first_sulphur

to the protocol, twenty countries did sign the protocol.³⁶ As a result sulfur emission between 1980 and 1993 in the participating countries was cut by fifty-five percent and the total sulfur emission in Europe was cut by forty five percent.³⁷

Again in 1994 a second protocol addressing sulfur was passed. This time instead of setting a specific percentage of reduction as a target goal, it set different goals for each country.³⁸ This approach was designed to “achieve the greatest possible effect of the environment at the least overall cost.”³⁹ This critical load approach is designed to get countries to reduce pollution to environmentally acceptable levels or a no effect level, instead of setting a percentage for countries to strive for.⁴⁰ This approach has an advantage, in that it requires each country to self-evaluate its pollution levels decide how much pollution it needs to reduce.

An example of this concept would be if there were two countries, country *A* and country *B* defined as one ecosystem. If country *B* in the largest polluter in the world and emits a 25% of the worlds sulfur pollution in the world, while country *A* in the smallest polluter world with relatively small sulfur emission levels. If both countries were to reduce their sulfur emission by thirty percent, it would certainly be good for the environment, but country *B* would still be polluting at an extremely high rate that could still overload the environments ability to effectively handle the pollution. Conversely, if both countries took a critical load

³⁶ United Nations Economic Commission for Europe, Protocol on the Reduction of Sulphur Emissions by at least 30%, Sept, 2, 2009, available at http://www.unece.org/env/lrtap/status/85s_st.htm

³⁷ The Convention on Long-range Transboundary Air Pollution (CLRTAP) Factsheet from the Swedish NGO Secretariat on Acid Rain, Supra.

³⁸ Id.

³⁹ Id.

⁴⁰ International Institute for Applied Systems Analysis, page 1 (1990), Available at <http://www.iiasa.ac.at/~heyes/docs/critload.html>

approach, each would find areas of improvement that would eventually bring all the total pollution levels down for the entire ecosystem below the critical load levels. In a practical sense this would require the larger polluted to reduce its' emission significantly more than the smaller polluter. This approach has the benefit of looking at the environment as a whole instead of individual countries and pollution as an international problem instead of a local problem.

There have been a number of other protocols that also have been added to LRTAP. In 1988 twenty-five nations passed the Nitrogen Oxides Protocol.⁴¹ The protocol mandated a two-step approach, the first step called for all participating parties to “freeze” all nitrogen oxides emission at their current level⁴² with each participating country's 1987 emission levels to serve as a baseline for comparisons.⁴³ The second step requires “the application of an effects-based approach, and applied a multi-pollutant, multi-effect critical load approach.”⁴⁴

In addition to these protocols there is a protocol that addresses VOCs or Volatile Organic Compounds. This protocol was designed to reduce ozone levels by thirty percent by 1999, using a 1988 as a baseline level of reference. In accordance with this protocol by ozone levels in Europe by 1999 had been reduced by thirty percent as a result of this protocol.⁴⁵ In 1998 a protocol aimed at reducing heavy metals was proposed. Specifically this protocol was aim at reducing cadmium, lead and mercury. By requiring that parties reduce their

⁴¹ The Convention on Long-range Transboundary Air Pollution (CLRTAP) Factsheet from the Swedish NGO Secretariat on Acid Rain. Supra.

⁴² United Nations Economic Commission for Europe, Protocol concerning the Control of Emissions of Nitrogen Oxides, page 1 (2009) Available at http://www.unece.org/env/lrtap/nitr_h1.htm

⁴³ Id.

⁴⁴ Id.

⁴⁵ The Convention on Long-range Transboundary Air Pollution (CLRTAP) Factsheet from the Swedish NGO Secretariat on Acid Rain. Supra.

emission of these metals to 1990 levels and by suggesting that specific polluters be required to use the “best technology available” this protocol laid out a strict requirements that has reduce the emissions of heavy metals significantly from 1990 to 2007.⁴⁶ There are also a protocol that addressed persistent organic pollutant that was passes in 2003⁴⁷ and latest protocol that addresses Acidification, Eutrophication and Ground-level Ozone that was passed in 2005.⁴⁸ Both of these protocols laid out strict standards that that have had a significantly reduced these pollutants.⁴⁹

It is apparent that on top of the flexible framework of the original treaty agreement, a series of increasingly stricter environmental regulations has been put in place through the use of these protocols. However, it could be argued that if the original agreement had attempted to start with very strict standards without concern for the differing backgrounds, levels of industrial activity, and individual concerns of each country, the successes that were achieved in this area would have been much more difficult. The fact that a large number of countries signed the treaty initially created a certain level of expectations both internationally and internally that additional steps would be taken towards more environmentally friendly policies.

⁴⁶ German Informative Inventory Report, 2.9 Emission Trends – Heavy Metals, (2007), Available at <http://iir-de.wikidot.com/heavy-metals>

⁴⁷ German informative Inventory, Report, 2.10 Emission Trends –Persistent Organic Pollutants (2007), Available at <http://iir-de.wikidot.com/persistent-organic-pollutants>

⁴⁸ United Nations Economic Commission for Europe, Protocols to the Convention, (2009), Available at http://www.unece.org/env/lrtap/status/lrtap_s.htm

⁴⁹ German Informative Inventory Report, 2.10 Emission Trends – Persistent Organic Pollutants, Supra.

THE BILATERAL AIR QUALITY AGREEMENT

The United States and Canada have a long history of agreements dealing with a wide variety of issues. These issues include trading agreements, national security, and of course environmental issues.⁵⁰ This is to expect since the two countries share 8,893 km of border⁵¹, which is the largest unprotected border in the world. That being said the U.S./Canadian relationship with regards to trans-boundary air pollution can be traced directly to the 1937 Trail Smelter Case.⁵² The facts of this case are relatively simple. Smelting activities whole and completely situated inside of Canada, approximately ten miles away from the shared border with the State of Washington, were emitting large amounts of sulfur into the air through the use of two smoke stacks. This pollution then drifted south and was deposited within the boundaries of the State of Washington where it negatively affected farming activities, specifically the growing of alfalfa, wheat and oats.⁵³ In response to this activity between 1928 and 1935 The United States lodge several complaints with Canada.⁵⁴ Eventually the two countries took the issue to the International Joint Commission (IJC-UC) where it was decided that the Trail Smelter plant should limit its' emission and pay the United States \$350,000 for damages.⁵⁵ However, after this ruling the condition and activities of the Trail Smelter plant didn't improve and eventually a convention was convened to answer four questions. Had damage been done to Washington State by the smelter since January 1, 1932? If the smelter was found to

⁵⁰ Elk Carl, Congressional Research Service, Canada –U.S. Relations, (2009), Available at <http://www.fas.org/sgp/crs/row/96-397.pdf>

⁵¹ Central Intelligence Agency, The World Factbook (2009) Available at <https://www.cia.gov/library/publications/the-world-factbook/fields/2096.html?countryName=United%20States&countryCode=us®ionCode=na&#us>

⁵² Jutta Brunnee, Transboundary Harm International Law: Lessons from the Trail Smelter Arbitration. 102 AMJIL 395, 395 (2008).

⁵³ Id.

⁵⁴ Id.

⁵⁵ Id.

have done damage, should it be made to refrain from doing so in the future? Should the smelter operate under any restrictions? Should any compensation be paid in light of the answers to questions 2 and 3?⁵⁶

It was eventually decided that the government of Canada should pay the United States \$78,000 and the Trail Smelter plant should ensure that future emissions don't damage property within the United States. To prevent future emissions from doing any damage it was ordered that Trail Smelter "measure the wind velocity, direction, and turbulence, atmospheric pressure, barometric pressures, and sulfur dioxide concentrations."⁵⁷ If Trail Smelter didn't comply with these requirements the United States would be entitled to further compensation that would be provided by the United States, the government of Canada and the Tribunal.⁵⁸

While the facts of the case are relatively simple in that only two countries were involved and there was a direct link between the a known polluting source and the harmful effect those pollutants were causing, within a specific known geographic region. It was from this case that the most basic rule of trans-boundary air pollution is formed. This rule simply stated is, "One State should not allow activities under its jurisdiction or control to harm the environment of a neighboring State or of areas beyond jurisdiction" or even more simplistic is the idea of "do no harm".⁵⁹ This rule recognizes each State's sovereignty and its ability to develop its own resources, while recognizing that each state is a member of the international community that needs to work with other neighboring countries.

⁵⁶ Id.

⁵⁷ Id.

⁵⁸ Id.

⁵⁹ Damato Anthony, Transboundary Pollution: Hazardous Activities, page 93 –151 (2001) available at <http://anthonydamato.law.northwestern.edu/IELA/Intech08-2001-edited.pdf>

With the Trial Smelter case serving as an excellent example of the type of corporation that is needed to resolve trans-boundary air pollution issues, Canada and the United States entered into the 1991 Bilateral Air Quality Agreement. This agreement is meant to serve as a facilitative document that allows the two countries to meet on an annually basis to discuss joint projects, share new research and technologies, and find new ways to generally improve the air that people breath.⁶⁰ This agreement has generally been successful in achieving a reduction of harmful emission involved in the agreement.⁶¹

The agreement requires that each party reduce their sulfur dioxide and nitrogen oxides.⁶² For the United States this meant a reduction in sulfur dioxide emission of about 10 million tons for the 1980 levels.⁶³ Also the United States would need to reduce its nitrogen oxides emission from 1980 levels.⁶⁴ All of these requirements for the United States also coincide with its' own requires found in the Clear Air Act.⁶⁵ In Canada's case this required a reduction of about 2.3 million tons of sulfur dioxide and a reduction of 970,000 tons of nitrogen oxides.⁶⁶ In order to measure each countries progress toward these goals, the agreement calls for a continual monitoring of each country's emissions.⁶⁷ In a more practical sense this means that any "new electrical utility unit and every electric utility greater than 25 mega-watts" that emits either sulfur dioxide or nitrogen dioxides

⁶⁰ The White House: President to Attend Copenhagen Climate Talks, page 1 (2009) available at <http://www.whitehouse.gov/the-press-office/president-attend-copenhagen-climate-talks>

⁶¹ Id.

⁶² International Joint Commission Canada & United States, Air Quality Agreement, page 1 (2009) available at <http://www.ijc.org/rel/agree/air.html>

⁶³ Id.

⁶⁴ Id.

⁶⁵ Id.

⁶⁶ Id.

⁶⁷ Id.

had to install and operate monitoring systems.⁶⁸ In addition to the monitoring requirements this agreement also requires both the United States and Canada to exchange information that is gathered as a result of the monitoring procedures. This meant that there is a coordination of the existing monitoring networks and building new monitoring stations in areas where monitoring is currently not occurring.⁶⁹

The agreement also creates an “Air Quality Committee” to review and address issue with respect to the implementation of this agreement.⁷⁰ This committee is made up of an equal number of people from each party, whose responsibilities consist of reviewing the implementation of the agreement, preparing reports every two years for each country, and publishing these reports after providing copies to each party.⁷¹ The committee is scheduled to meet once a year, but it may meet additionally if the either of the parties request.

In addition to the Air Quality Committee the agreement empowers the International Joint Commission⁷² to help in the implementation of this agreement. These responsibilities include holding public hearings and taking public comment, preparing reports based on public comments and finally passing on these reports on to the public and the parties.⁷³ Beyond these duties the IJC also plays an important role in the dispute resolution process created by this agreement.

If the parties find that there is a dispute concerning a matter related to the issues addressed in the agreement, either party may request that that dispute be settled through a

⁶⁸ Id.

⁶⁹ Id.

⁷⁰ Id.

⁷¹ Id.

⁷² Id.

⁷³ Id.

“consultation” with the other party.⁷⁴ If such a request is made the “consultation” must convened as soon as possible but no later than thirty day.⁷⁵ Consultation appears to be an attempt to resolve the disagreement through a quasi-informal proceeding. If however, “consultation” the parties are unable to reach a satisfactory conclusion to the disagreement, the parties can enter a second stage of dispute resolution that calls for negotiations between the parties.⁷⁶ This stag appears to be much more formal in it setting and is the last attempt to resolve the dispute before the parties refer the matter to an outside authority for resolution. If the dispute cannot be resolved by the negotiation stage, the parties may submit the dispute to the International Joint Commission for an additional opinion.⁷⁷ The procedures for International Joint Commission are actually outlined in the 1909 Boundary Waters Treaty articles IX and X.⁷⁸ As outline in the Boundary Waters Treaty the IJC ruling doesn’t have the effect of law or force behind it, its’ ruling are persuasive but not binding.⁷⁹ Noticeable absents from the agreement is any referral to what would happen if the parties could simply not agree on a resolution to a given dispute. However, the agreement does allow for one of the parties to terminate this agreement at anytime, provided that the terminating party provides written notice one year prior to the termination of the agreement.⁸⁰

The Bilateral Air Quality Agreement is different than the LRTAP in that there is more adaptation of national law that is decided by the counties involved. Throughout

⁷⁴ Id.

⁷⁵ Id.

⁷⁶ Id.

⁷⁷ Id.

⁷⁸ International Joint Commission Canada & United States: What is the Boundary Waters Treaty? Page 1 (2009) available at <http://www.ijc.org/rel/agree/water.html#text> article IX

⁷⁹ Id.

⁸⁰ International Joint Commission Canada & United States, Air Quality Agreement, page 1 (2009) available at <http://www.ijc.org/rel/agree/air.html>

both annex one, which lays out the commitments made by each party, there is repeated reference to the United States Clean Air Act and to the United States Environmental Protection Agency.⁸¹ In many ways this agreement appears to be an international extension of many of the standards set forth in the Clear Air Act for the United States. The Bilateral Air Quality Control Agreement is thus a less centralized agreement. Even the Air Quality Commission and the International Joint Commission is not given any enforcement powers or the ability.⁸² This approach to trans-boundary air pollution for countries to take a less centralized approach where individual countries are able set the standards to a level that is their own making. While the LRTAP agreement is a much more centralized approach where decisions are made from the top and passed down to the countries involved. However, both these agreements have had a success in reducing air pollution and there appears to be not reason while continued success cannot be sustained in the future.

CHINA'S NEED FOR AN INTERNATIONAL AGREEMENT

While the United States, Canada and Western Europe along with many other countries worldwide have had success reducing trans-boundary air pollution, many of these successes could be offset if China does not also take steps to reduce its pollution emissions.⁸³ It seems impossible to understate China's problem with air pollution. Currently seven of the world's top ten most polluted cities are in China and two-thirds of

⁸¹ Id.

⁸² Id.

⁸³ Kim, Juli, Turner, Jennifer, Foreign Policy in Focus: China's Filthiest Export, page 1 (2007) available at <http://www.fpif.org/fpiftxt/3978>

China's 343 large cities fall below China's own air quality standards.⁸⁴ China has even passed the United States as the world's largest producer of green house gasses.⁸⁵ China will produce 3.1 billion tons of CO₂ in 2009⁸⁶ and currently the largest single polluting power plant in the world is in China.⁸⁷

This serious pollution problem has a catastrophic effect on both China's populace and environment.⁸⁸ However, these harmful effects are not limited within China's own borders. China's SO₂ emissions are responsible for half of the acid rain that falls on both North and South Korea along with Japan.⁸⁹ Also as China's deserts continue to grow as a result of desertification, the resulting extreme dust storms are having an adverse effect in places as far away as California. Trans-boundary dust regularly affects California's air quality and threatens to undue much of California's stricter requirements under the U.S. Clean Air Act for air emissions.⁹⁰ Other researchers have found that mercury from China is beginning to reach toxic levels in animals in the Pacific Northwest.⁹¹

As can be seen China's air pollution is not so simply dismissed as a Chinese problem, air pollution with origins completely within the borders of China have detrimental and lasting effects of the world's environment. It's obvious that an international approach must be taken to help China curb and reduce its air pollution issues. As China prepared to host the Olympics in 2008, steps were taken to reduce

⁸⁴ Dini, Jack, American Thinker: The geography of Carbon Emissions, page 1 (2009) available at http://www.americanthinker.com/2009/05/the_geography_of_carbon_emissi.html

⁸⁵ Cernter for Global Development, China Passes U.S., Leads world in Power Sector Carbon Emissions page 1 (2008) available at <http://www.cgdev.org/content/article/detail/16618/>

⁸⁶ Id.

⁸⁷ Id.

⁸⁸ Foreign Policy in Focus: China's Filthiest Export, page 1 Supra.

⁸⁹ Id.

⁹⁰ Id.

⁹¹ Id.

emissions and to strength China's environmental policies.⁹² Unfortunately many of these efforts have not produced the desired results and pollution is still a major concern both inside and outside of China.⁹³ While China's efforts seem sincere it appears that the problem has simply grown so large that China cannot resolve without outside help.

The question that must be answered is does any of the existing models of trans-boundary air pollution models work for China or does a new type of model need to be created in order for China to reduce its air pollution. Under the two major existing models for trans-boundary air pollution control, a regional approach is taken. This means that countries that are in close geographic proximity enter into agreements to mutually control and reduce their air pollution to the benefit of both countries. In the Chinese context this would mean that China would most likely have to enter into an agreement with both South Korea and Japan. These counties make the most likely parties because Korea and Japan are the two countries that are most directly affected by China's air pollutions and all three countries would represent the major economic powers in the region.⁹⁴ This regional approach would have the benefit of being able to look at the regions environment as one collective entity as opposed to each country viewing their environment as an entity apart from their neighbors.

The other option would be an economic approach where countries that are

⁹² China Daily, New drive to clean up Beijing air page 1 (2008) available at http://www.chinadaily.com.cn/olympics/2008-02/26/content_6484791.htm

⁹³ China Daily, Water, air pollution in China still serious, page 1 (2009) available at http://www.chinadaily.com.cn/china/2009-02/24/content_7508856.htm

⁹⁴ Jianxiong Wang, Economic Growth Structure and Empirical Comparisons: China, Korea, and Japan. Page 381-417 (2001) available at http://nsl.nii.ac.jp/els/110004532327.pdf?id=ART0007287151&type=pdf&lang=en&host=cinii&order_no=&ppv_type=0&lang_sw=&no=1259112107&cp=

(The author acknowledges that North Korea and Taiwan are important countries within this region, however do the relative close relations that both these countries have with China or to be more exact the pressure that China could exert on these countries makes them unproductive parties to an international agreement that is designed to hold countries accountable to other sovereigns.)

similarly situated. Since economic development and increased pollution emissions are often connected, these countries would face similar problems and often have a common enough baseline that would allow each country to take meaningful steps towards pollution control while not having to meet standards of more developed countries. This approach, in China's case, would most likely include the countries that are commonly known as BRIC countries. The BRIC countries are Brazil, Russia, India and China.⁹⁵ Because these countries are in the process of developing their economies, a common air pollution treaty or agreement could possibly encourage these countries to implement good environmental practices and still enable each country to keep developing its' economy.

Of course China could simply join a pre-existing agreement such the two that have already been discussed, LRTAP and the Bilateral Air Quality Agreement. The problem with such an approach is that the countries involved with these agreements have already taken significant steps to reduce pollution levels and it may be difficult for China to meet those pre-existing standards. By entering into a new agreement a series of obtainable standards could be agreed upon and implemented. Whether this would mean an agreement with China's neighboring countries or similarly situated countries, a new agreement appears to be the best approach for China.

What would such an agreement look like? With LRTAP and the Bilateral Air Quality Agreement as models, it's clear that a successful agreement will have some common elements in it. First, both the previously discussed agreements contain a statement of some common principles or understanding that will govern the scope of the

⁹⁵ Bryanski, Cleb, [TEXT-Full text of BRIC countries joint communique](http://www.reuters.com/article/usDollarRpt/idUSLE47000820090314), page 1 (2009) available at <http://www.reuters.com/article/usDollarRpt/idUSLE47000820090314>

agreement.⁹⁶ These principles express the participating parties' common understanding of what areas this agreement will cover and how far the agreement will reach. Second, the agreement must include in way manner and how often information that each party has complied is to be shared with the other parties.⁹⁷ Since international agreements are designed to one, help countries achieve common goals and two, and allow neighboring countries to be able to monitor the activities of each other, it's critical that an agreement calls for and facilitate the free flow of information. This is essentially the accountability part of any agreement, if a country knows that it doesn't have report its' progress to the other parties there is not pressure on a country to implement the agreement.

Next the agreement must create a governing body that has power to implement the agreement and to ensure that the agreement in meeting its stated objectives.⁹⁸ This body must be empowered to commence studies, review the activities of the countries and to make suggestions to the participating parties reprehensive that have the ability to make binding decisions. This governing body makes it impossible for countries to ignore the agreement. Because this body would have the ability to commence studies and make suggestion that can become binding law, the parties will at a minimum have to address the action taken by the governing body. This body should also have a part in any dispute resolution procedures that the agreement must entitle. It's absolutely necessary that this agreement would outline any for the parties to resolve any disputes. Since the governing body would be in a good position to determine what has been successful and what

⁹⁶ International Joint Commission Canada & United States, Air Quality Agreement, page 1 (2009) available at <http://www.ijc.org/rel/agree/air.html>, see also 1979 Convention on Long-Range Transboundary Air Pollution, Air pollution, Art. 1, 1983, Available at <http://www.unece.org/env/lrtap/full%20text/1979.CLRTAP.e.pdf>

⁹⁷ Id.

⁹⁸ Id.

countries understood the agreement covered, it should have a role in the dispute resolution procedures.

Based on the past success of both LRTAP agreement and the Bilateral Air Quality Agreement it appears that China could use one of the existing model to curb its air pollution problem. The most desirable course of action would be for China to enter into an agreement with its' neighboring countries, in an effort to lessen the impact on the environment within the immediate area. However, an economic based approach would certainly be better than no inaction on the part of China. The critical issue is that China take steps to reduce its' air pollution emission to ensure that the world's environment is protected by the community of nations.

CONCLUSION

The threat of trans-boundary air pollution is a problem that can be connected to the global concern over climate change. It is clear that the even countries that are geographically separated by large distances, can still affect each other. However, this problem has been successfully dealt with by a series of international agreements. As China economy continues grows it is necessary that China enters into an agreement that help curve its pollution emission. Whether this agreement takes a critical load approach with its neighboring countries and an economic approach, it's critical that China take steps to curve its' emission while trying to take steps to enter into the international community of nations.