

# CAN EMISSIONS TRADING WORK BEYOND A NATIONAL PROGRAM?: SOME PRACTICAL OBSERVATIONS ON THE AVAILABLE TOOLS

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## 1. INTRODUCTION

Over the past ten years, the concept of emission trading has become the darling of innovative regulators and business people in the United States. The 1990 Amendments to the Clean Air Act contained the first nation-wide emission trading program for the reduction of Acid Rain.<sup>1</sup> Several regional air quality districts, like the South Coast Air Quality Management District (“SCAQMD”) Regional Clean Air Incentives Market (“RECLAIM”) program in California, and the State of Illinois, have also developed emission trading programs to enable them to attain the National Ambient Air Quality Standards (“NAAQS”) for various pollutants.<sup>2</sup> Most recently, in the context of ongoing meetings of the subsidiary bodies of the United Nations Conference on Environment and Development Framework Convention on Climate Change (“FCCC”),<sup>3</sup> the United States has proposed

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<sup>1</sup> See 42 U.S.C. § 7651 (Supp. II 1990).

<sup>2</sup> See *infra* notes 14-19 and accompanying text.

<sup>3</sup> United Nations Conference on Environment and Development: Framework Convention on Climate Change, May 9, 1992, 31 I.L.M. 849. For a review of the history of the FCCC and of the prospects for the development of an international emissions trading regime thereunder, see Tanya L. Forsheit, Comment, *International Emissions Trading: Equity Issues in the Search for Market-Based Solutions to Global Environmental Degradation*, 18 U. PA. J. INT’L

a tentative framework for an international emission trading program to reduce greenhouse gas emissions.<sup>4</sup>

Under the United States Draft Protocol, each participating nation would be assigned an "emission budget," which would be reduced over time.<sup>5</sup> To satisfy emission requirements, participating nations could trade emission reductions with other nations or use their own "banked" emissions from previous years.<sup>6</sup> The program also requires reductions in greenhouse gas emissions from developing nations and provides incentives for these countries to join the trading program.<sup>7</sup>

Proponents of emission trading hope that such trading can provide an effective vehicle for addressing global warming issues. Indeed, many features of the global warming debate appear to fit the key criteria for an emission trading program. Advocates of reducing greenhouse gas emissions to prevent global warming assume, with varying degrees of scientific evidence and support, that there is a limit or "cap" on the amount of greenhouse gas emissions the Earth can withstand and still promote life on the planet as we know it. Using the concept of a cap, greenhouse gas emissions can be allocated among parties using this valuable resource. Given the difficulties associated with the allocation of these emissions, however, development of a market-based system in which all interested parties can participate appears to be an attractive option. Under such a system, allocated emissions, which are essentially "rights" or "entitlements," are put forward as the currency for the efficient allocation of resources.

As appealing as this strategy appears, the details can — if not carefully addressed and resolved — destroy the progress promised by champions of emission trading and global warming controls. For a trading program to be successful, allotments must be considered in the same way as currency or property rights are addressed. The treatment of air resources may be analogized to the treatment of real property rights centuries ago, and perhaps more importantly to the currency creditability issues that were

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ECON. L. 689 (1997).

<sup>4</sup> See U.S. Dept. of State, U.S. Draft Protocol Framework, January 17, 1997 [hereinafter "Draft Protocol"].

<sup>5</sup> See *id.*, art. 2.

<sup>6</sup> See *id.*, arts. 6, 2 para. 5.

<sup>7</sup> See *id.*, art. 7.

problematic in this country until fairly recently.<sup>8</sup>

To make emission reductions through emission trading vital, there must be sufficient criteria to enable private parties to make reliable economic assessments. The broad discretion evident in the current proposals must be eliminated if the benefits of emissions trading are to be realized.<sup>9</sup> To be useful, an international emission crediting program must be based on objective and certain criteria, unfettered by governmental restrictions for a known period of time.

The following are some observations concerning the issues which must be resolved in order to implement a viable international emission trading program. While there is much to be improved, the Draft Protocol is a beginning from which trading ideas can be inserted.

## 2. THE OBSTACLES TO INTERNATIONAL EMISSION TRADING

### 2.1. *Is There a Consensus on the Resource?*

Most developed countries concur that the global warming issue must be addressed. The debate is whether we know enough now to begin setting emission reduction targets or if it is already getting perilously late in the process. First, there must be a consensus that there is a need for action; second, there must be a general consensus on the time table for that action. Developing countries are concerned that setting such reduction targets could impose a severe impediment to their growth.

The U.S. proposal appears to straddle these concerns by proposing a program containing specific budget periods.<sup>10</sup> The Draft Protocol also calls for "emission budgets" by signatory countries.<sup>11</sup> How these emission budgets are to be set presents the initial impediment to a global program.

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<sup>8</sup> In this connection, it is instructive to recall the silver crises, and the issue of whether the dollar should be tied to the international price of gold.

<sup>9</sup> See discussion *infra* section 2.

<sup>10</sup> See Draft Protocol, art. 2. The Draft Protocol proposes specific budget periods for developed countries. Allowable emissions would be reduced in each subsequent period. While the Draft Protocol does not specify emission budget periods, the United States has indicated it should focus on a "medium" term of approximately ten years. See U.S. Dept. of State, *Fact Sheet on Climate Change Proposal*, "Negotiations Background and Calendar," January 17, 1997.

<sup>11</sup> See Draft Protocol, art. 2.

Establishing the time table and emission reduction targets provides a start. One of the remaining questions, however, is whether the targets are to be measured strictly by emission reductions on a country-by-country basis, or whether the emission budgets allow for "offsetting" emissions, such as by maintenance and enhancement of forests and other vegetative masses which convert carbon dioxide to oxygen. Allowing such "offsets" may or may not be environmentally justified. Such "offsets" may or may not facilitate an agreement for an international treaty.

It is useful, in this regard, to recall the earlier analogy to currency.<sup>12</sup> If the currency is continually being valued and devalued, the risks inherent in making a trade — unless those risks can be quantified and limited — will frustrate transactions. Similarly, until the offset issue is resolved and emission budgets specified, emission trading on the international level will be frustrated by vague criteria.

Emission credits based upon rate of emissions (i.e., relative efficiency) do not address the "Tragedy in Commons" perspective of governmental regulators. There has not been an effective emission reduction program associated with emission trading that did not have a "cap" aspect to it. Hence, without an "emission budget," international trading is not likely to succeed.

## 2.2. *Feasibility*

The feasibility, both politically and technically, of capping power generation is a critical issue. The United States has historically favored relative efficiency as a method of defining acceptable emissions. The Environmental Protection Agency's "New Source Performance Standards," "Reasonably Available Control Technology" requirements, "Best Available Control Technology," and "Lowest Achievable Emission Rate" are all defined in terms of emissions per unit of production. Capping emissions, however, suggests a limit on production. Indeed, until the Acid Rain program under the 1990 Amendments to the Clean Air Act, the notion of capping emissions related to power generation was novel.

Capping emissions does not, however, necessarily mean that power demands cannot increase. It does mean that efficiency of

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<sup>12</sup> See *supra* note 8 and accompanying text.

units of production of power must be improved. This sets up competition among fossil fuels (natural gas versus petroleum versus low sulfur and high sulfur coal), and potentially between developed and developing nations on the international scale.

The debate over capping emissions, however, presents several difficult issues. One of the potential problems concerns the relationships between stack emissions of carbon dioxide versus carbon dioxide consumption by vegetative cover. Another divisive issue underlies the support (or lack thereof) for exporting innovative and efficient technologies, or for improving energy utilization.

These issues make clear that a global approach will require innovative support and financing for developing nations to ensure that they can afford the kinds of efficient production systems, and the accompanying monitoring systems, necessary to meet the expectations of the Draft Protocol. The remainder of this essay focuses on the technical issues that must also be resolved to facilitate international emissions trading.

### 2.3. *Can the Emission Credits be Quantified?*

Once the emission budget is determined, a second critical condition is how the credits can be quantified, and the trustworthiness of that quantification. Based upon the first few years of the Acid Rain Program, supporters of emission trading argue that trading has resulted in significant early emission reductions. It is not clear, however, that emission trading will work in every forum. In California, SCAQMD's RECLAIM program for hydrocarbons purportedly failed because it tried to focus on very small emission units, and covered a wide variety of very small sources. As evidenced by the Acid Rain program and the early emission offset trading programs, emission trading will only work for those industries with sufficient expertise to accurately monitor and quantify their emissions.

The successful emission trading programs cap total regulated emissions.<sup>13</sup> Development of an emission cap for the region,

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<sup>13</sup> Other emission trading programs which are credit-based can also enable industry to comply with environmental regulations in a cost-effective manner. These programs, however, do not result in mandatory emission reductions. Indeed, concern over "paper offsets," and over the possibility that offsets for new sources would not achieve real environmental progress, led to several EPA policies in the 1980s which effectively stifled trading. See Emission Trading

however, requires extensive emission data for all sources slated to be in the program. Despite the emission quantification requirements of the various state implementation plans, many regions of the United States do not currently have the necessary emission information.

Some air quality management districts have developed the type of emission data necessary to implement an effective emission trading program. One such district is Illinois. In 1996, the Illinois Environmental Protection Agency formally proposed a "cap and allocate" trading program for the severe ozone non-attainment area surrounding Chicago.<sup>14</sup> Under this proposed program, all major sources with more than ten tons of volatile organic material emissions during the summer months will be issued trading allotments for use during the ozone season.<sup>15</sup> Each source's initial allotment will be decreased by twelve percent from its baseline emissions.<sup>16</sup> To comply with the requirements of the program, each source must possess, at the end of the emission reconciliation period, allotments equal to its seasonal emissions.<sup>17</sup>

Illinois has been able to develop this program for several reasons. First, Illinois has a long history of environmental regulation. The state has had an operating permit program for sources of criteria pollutants for over twenty-five years,<sup>18</sup> and major sources in the Chicago non-attainment area have been subject to significant reporting obligations under the Chicago Federal Implementation Plan ("FIP") since 1990.<sup>19</sup> Due to this

Policy Statement, 51 Fed. Reg. 43815 (1986). The 1990 Amendments responded by mandating extra emission reductions offsets for major sources of volatile organic compounds located in non-attainment areas, and for the Acid Rain program. See 42 U.S.C. §§ 7511a, 7651 *et seq.* (Supp. II 1990).

<sup>14</sup> See *In the Matter of: Emission Reduction Market System, Adoption of 35 Ill. Admin. Code 205 and Amendments to 35 Ill. Admin. Code 106, No. R97-13, 1996 Ill. Env. LEXIS 848 (Dec. 5, 1996).*

<sup>15</sup> See Ill. Reg. \_\_\_ (to be codified at ILL. ADMIN. CODE tit. 35, § 205.200). The Pollution Control Board anticipates submitting the rules cited in notes 15-17, 23, and 29 for First Notice publication in the Illinois Register in Spring or Summer 1997. See 21 Ill. Reg. 1431, 1439(f) (1997).

<sup>16</sup> See Ill. Reg. \_\_\_ (to be codified at ILL. ADMIN. CODE tit. 35, § 205.400(c)).

<sup>17</sup> See Ill. Reg. \_\_\_ (to be codified at ILL. ADMIN. CODE tit. 35, § 205.150(c)).

<sup>18</sup> See ILL. ADMIN. CODE tit. 35, §§ 201.143-201.144 (1996).

<sup>19</sup> See 40 C.F.R. § 52.741 (1996). The FIP has been superseded by the rules codified in ILL. ADMIN. CODE tit. 35, § 218 (1996).

history of regulation, emission sources in the Chicago area, along with the Illinois Environmental Protection Agency, have developed the sophisticated emission quantification knowledge necessary for the implementation of an emission trading program.

Additionally, since sources in the Chicago non-attainment area have been subject to stringent environmental regulation for many years, these sources understand the benefits that emission trading has over traditional command and control requirements. Unlike traditional command and control programs, the proposed Illinois trading program provides sources that can control emissions in a cost effective manner with the incentive to exceed emissions reductions requirements by giving them value for these excess reductions. The program also enables smaller sources for which control is prohibitively expensive to comply with emission reduction requirements by purchasing allotments on the open market. Thus, the program furthers both business growth and environmental improvement.

Accurate quantification, however, is difficult. Sophisticated emission monitoring and recordkeeping is often required. Even in the United States, with its extensive history of environmental regulation, certain sources do not yet have sufficient emission quantification information to make the emission baseline determination necessary for participation in a trading program. Many other developed, not to mention developing, countries do not have the necessary building blocks in place to quantify emissions accurately.<sup>20</sup>

Quantification of emissions is essential for the success of any trading program on the international level. Accurate quantification is necessary not only to determine the overall emission "cap," but also to create confidence in the emission trades that are to be made. Participating sources or nations will not likely trade emissions with other parties if they cannot accurately quantify the emission reductions. Emission quantification, therefore, goes directly to the integrity of an international trading program.

Fortunately, greenhouse gases may be measured if those gases are defined and emission budgets set. Most typical power plant

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<sup>20</sup> While the ISO 14001 series may help, that protocol is systematic, not substantive. An extra level of specifications, such as one derived from the EPE ("Environmental Performance Evaluation") protocol (ISO 14031), will likely be necessary in the implementation of a larger scale trading program.

emissions can be monitored in a variety of non-capital intensive ways that are consistent with basic fuel input. Measurements based upon information that is normally kept for production purposes can be confirmed with periodic stack tests or other emission testing to yield an emission factor. Verifiable monitoring can thus be tied to basic production characteristics, provided operational characteristics are represented by the emission factors. This method of emission calculation has been used at fossil fuel power plants for several decades. Similar emission calculations, however, have not been done routinely for other types of greenhouse gas sources. The experience in developing emission trading programs in U.S. non-attainment areas like Chicago, as detailed in this section, highlights the need for workable quantification systems to facilitate trading, both within the United States and on the international level.

### 3. HOW WILL THE PROGRAM BE IMPLEMENTED?

Once a consensus has been reached on the resource to be protected and accurate quantification methods have been adopted, the knotty issues of implementation arise. These issues include: enforcement, industry participation, duration, environmental impact, and the establishment of a viable market.

#### 3.1. *Enforcement*

The first issue to be addressed is the appropriate method of enforcement. An effective enforcement mechanism ensures that the emission credits being generated or sold are valid, and thereby fosters confidence in the market. Lack of proper enforcement will defeat efforts to trade emission credits, even between entities with readily quantifiable and verifiable emission estimates.

Where emission budgets or emission inventories are based on faulty or incomplete information, the trading program participants who have precise data are handicapped and potentially put at a competitive disadvantage. These countries will be reluctant to participate in an international trading program without proper incentives. Similarly, there must be an incentive for countries with currently incomplete or inaccurate emission data to require industry in those countries to implement acceptable emission quantification standards. An effective enforcement mechanism is essential as it provides one such incentive.

The kind of enforcement discussed here is in the context of



“incentives.” It is not the heavy-handed, command-and-control enforcement long favored by the U.S. Environmental Protection Agency (“EPA”). It should be in the nature of quality assurance, data validation, and other evolving concepts that are not focused on penalizing the offender, but rather verifying the emission quantification. Again, the systemized standards being developed for Environmental Management Systems and Environmental Performance Evaluations may provide a norm and accepted practice.

### 3.2. *Industry Participation*

Even if there were monetary incentives for countries either to join the emission trading program or otherwise to reduce emissions of greenhouse gases, it is unclear whether these incentives would adequately compensate private industry. The cost of training employees and performing emission quantification may be relatively large. As evidenced by the history of emission trading in the United States, without the support of private industry, emission trading cannot be successful.

The Draft Protocol sets a national emission budget.<sup>21</sup> This type of budget, however, leaves the negotiations concerning emission allocations at the nation-state level rather than encouraging industry involvement. Thus, the Draft Protocol does not create a private market for industry. Under the Protocol, individual industries will not be able to negotiate with industries in other countries to set quantity and price for credits without government involvement. This interjection of government into the negotiations will ultimately result in a price determined by political goals rather than one set by market forces. This price will not reflect market concerns; as such, at least one of the parties to the trade will not be adequately compensated. The wronged party will thus be less likely to continue to participate in the market. Eventually, the market will be non-existent. To prevent this failing, any international program should enable industries to negotiate amongst themselves with minimal governmental oversight.

Similarly, an international emission trading program must enable innovative industries to generate emission credits. During

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<sup>21</sup> See Draft Protocol, art. 2.

the early years of emission trading in the United States, emission credits were often subject to stringent "special conditions." These conditions were often subjective, and laden with extra requirements that created disincentives for credit generation, rather than incentives to reduce emissions.

To avoid the pitfall of discouraging participation by industry in the trading program, the program rules must set forth specific criteria for generating and obtaining recognizable trading units. The criteria must be objective and verifiable; generation of emission reductions cannot be left to the subjective judgment of parties who may have an interest in either keeping emissions within their borders or obtaining certain concessions in exchange for certifying inadequate emission credits. Given the nature of international diplomacy, which often results in concessions in one area to gain strides in another, the need for clear, straightforward, and objective rules is apparent.

### 3.3. *Duration*

Emission reduction credits in the United States are defined by time. For a company to install a new facility or make a significant modification to an existing facility, the EPA requires essentially permanent emission reduction credits.<sup>22</sup> In other instances, states may define the life of an emission credits seasonally.<sup>23</sup> The Acid Rain trading system under the 1990 amendments to the Clean Air Act uses allotment units with a defined lifetime of a few years, at the expiration of which the allotments may be reduced.<sup>24</sup>

The Draft Protocol, however, ignores the importance of setting the duration of emission reduction credits. The Draft Protocol employs the concept of borrowing emission reductions from one budget period as against the next.<sup>25</sup> This is not without justification since the general issue is not whether the ambient air quality level is set according to a duration of one hour, twenty-four hours, or even according to an annual average. Nevertheless, the concept of essentially "borrowing against the future" suggests a lack of rigor and commitment to reductions.

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<sup>22</sup> See 40 C.F.R. § 51 app. S (1996).

<sup>23</sup> See \_\_\_ Ill. Reg. \_\_\_ (to be codified ILL. ADMIN. CODE tit. 35, § 205).

<sup>24</sup> See 42 U.S.C. § 7651d.

<sup>25</sup> See Draft Protocol, art. 2 para. 6.

Moreover, without a specified duration for the life of the credit, the business and environmental risks are undefined and international trading is not realistically possible. Sources, whether they are acquiring or selling emissions credits, must have certainty as to the validity of the unit that they are acquiring. The duration of the unit needs to have a minimum life from economic perspectives; from an environmental perspective, there must also be an upper limit on its duration. Fixing the time period reflected by the unit avoids many of the controversies that have plagued the emission marketing systems prior to the 1990 amendments to the Clean Air Act. Indeed, establishing a definite life for a credit can encourage industry participation in an international trading program by facilitating long term planning for businesses, to the long-term benefit of the environment.

### 3.4. *Environmental Impact*

The successful emission trading approaches in the United States take a long-term view as to environmental improvement. One of the greatest difficulties of the 1970 Clean Air Act was its use of three-year deadlines for achieving national ambient air quality standards.<sup>26</sup> The only way to reduce emissions on such a short-term basis is to install add-on pollution control equipment. These add-on controls, however, transfer the pollution issues from the air to the water, land, and in some instances back to the air. Technology and customer approval requirements do not move so quickly. Since many of the pollution prevention efforts affect the product itself, product specifications must be taken into account.

A successful emission market system, therefore, must rely on longer time periods, on the order of ten years or longer, to achieve environmental goals. The chlorofluorocarbon ("CFC") phase-out under the Clean Air Act (which is really another type of "cap and allocate" system) allows for ten years.<sup>27</sup> The Acid

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<sup>26</sup> States were required to attain the ambient air quality standards set by the EPA within three years. See 42 U.S.C. § 7410(c). Three years is generally enough time to install an end-of-pipe system, such as a scrubber, baghouse, or thermal oxidizer. It is much too short a time for implementation of product substitutes or pollution prevention measures.

<sup>27</sup> See 42 U.S.C. § 7671a (1996); The Montreal Protocol on CFCs also requires a phase-out of CFC uses. See Montreal Protocol on Substances That Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1550 (entered into force Jan. 1, 1989).

Rain allowance program has an allocation schedule extending over fifteen years.<sup>28</sup> Similarly, Illinois' emission reduction market system envisions a ten year planning cycle.<sup>29</sup> The Draft Protocol takes long-term planning into account by setting "middle term" objectives for the reduction of greenhouse gases.<sup>30</sup>

By using these longer schedules, planners can demonstrate an environmental benefit associated with emission trading systems, while providing business with the ability to make long-term plans and, potentially, to develop less polluting materials. This sort of schedule would avoid the application of the "hurry-up" approach of very short time tables which foster "end-of-pipe" approaches to environmental control<sup>31</sup> in the development of an international trading program.

### 3.5. *Is There a Market?*

There must be a market to facilitate an effective resource allocation in an international emission trading program. Ad hoc exchanges are more akin to a barter system than to any market as we understand it today. The sharing of information concerning available and mandatory emission reductions can only become a reality if the tools are in place to enable the dissemination of this information. These information-sharing concepts have been generally alien to environmental regulators, particularly in the "command and control" system developed by the United States and often shared by other countries.

The sophistication of other countries is a necessary element in any sort of global trading strategy. While American expertise in environmental monitoring may need to be exported to facilitate the development of an international emission trading system, the sophistication necessary to implement this type of a program can also be fostered by educational and related infrastructure improvements. Use of an ISO 14001 and EPE process, specifically tied to greenhouse gas or global warming issues, might provide a framework.<sup>32</sup> The World Bank may also have a role in promoting the creation of the infrastructure necessary for environmental

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<sup>28</sup> See 42 U.S.C. § 7651a *et seq* (1996).

<sup>29</sup> See \_\_\_ Ill. Reg. \_\_\_ (to be codified at ILL. ADMIN. CODE tit. 35, § 205).

<sup>30</sup> See *supra* note 10.

<sup>31</sup> See *supra* note 25 and accompanying text.

<sup>32</sup> See *supra* note 20 and accompanying text.

monitoring worldwide.

Without this sort of broad participation, a true global market will not occur. While there may exist opportunities in very specific situations to “trade” something of value related to greenhouse gases, the notion that such trading can occur rests far in the future, even if a consensus is reached on the desirability of such a global program.

#### 4. CONCLUSION

While there are several obstacles to the development of an international emission trading program for greenhouse gases, the establishment of such a program could have great benefit. Not only could the program encourage innovation in developed nations, but the program could also provide developing countries with the incentive to reduce greenhouse gas emissions by giving those reductions economic value. The net result would be more efficient energy production and fewer emissions of greenhouse gases. These reductions, however, may not occur on a precise schedule; therefore, regulators and diplomats must be patient and allow the program to operate.

The Draft Protocol proposed by the United States in January 1997 does not meet the criteria of a successful privatized emission trading program. Indeed, privatized emission trading programs on an international scale may not be attainable. For such a trading program to be successful, it is critical that it provide adequate certainty to the participants that emission reductions are real and quantifiable, and the program must provide sources with sufficient notice of required emission reductions to facilitate long-term planning. Such a program, if developed and implemented, could enable both developing countries and mature economies to participate in a cost-effective program designed to slow or eliminate global warming.