

Introduction

The Kyoto Protocol to the United Nations Framework Convention on Climate Change creates a new regime aimed at reducing global emissions of greenhouse gases. Under the Kyoto Protocol, nations will be assigned a maximum amount of greenhouse gases that they may emit during a specified period. It is expected that this assigned amount will be lower than existing greenhouse gas emissions, thus leading to an overall reduction in emissions. To assist nations in reducing their emissions, the Kyoto Protocol creates several different mechanisms that may be used. These mechanisms include emissions trading, storage or sequestration of carbon in sinks, joint implementation and the clean development mechanism.¹ In order to facilitate the implementation of the Kyoto Protocol and its various mechanisms, the emissions reduction system relies upon the concept of an “emission allowance” or “carbon credit.” An emission allowance or a carbon credit represents a “unit” of emissions that can be transferred between parties under the Kyoto Protocol.

In order to implement the Kyoto Protocol, it will be necessary for individual nations to enact legislation dealing with emission allowances and carbon credits. Specifically, there will need to be legislation that clearly defines an emission allowance or carbon credit so that it can be dealt with in any emission trading system. In defining an emission allowance or carbon credit, the following issues will be addressed:

1. What are the types and quantities of greenhouse gases that constitute a single allowance or credit?

2. What is the term of validity of an allowance or credit?
3. What are the different forms of emission allowances or carbon credits?
 - (a) Domestic Assigned Amount Units;
 - (b) Domestic Carbon Credits for Sequestered Carbon; and
 - (c) Foreign Assigned Amount Units.
4. Conclusions and Recommendations regarding a definition of emissions allowances and carbon credits.

1. Types and Quantities of Greenhouse Gases

Article 3.1 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change requires parties to keep greenhouse gas emissions below their assigned amounts of “Carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A.” Those greenhouse gases are as follows:

Carbon dioxide (CO₂),

Methane (CH₄),

Nitrous Oxide (N₂O),

Hydrofluorocarbons (HFCs),

Perfluorocarbons (PFCs) and

Sulfur hexafluoride (SF₆).²

¹ Kyoto Protocol to the United Nations Framework on Climate Change, December 11, 1997

² see note 1, supra, at Annex A.

It appears to be very widely, if not universally, accepted that the greenhouse gas emission trading system will be based on one metric ton of carbon dioxide equivalent. For example, the European Union emission trading system states, in Article 3(a), that an allowance is “an allowance to emit one ton of carbon dioxide equivalent during a specified period.”³ Similarly, the Australian Greenhouse Office issued a series of discussion papers related to establishing a national emissions trading system. Throughout those discussion papers, they discussed the unit of trade as being a metric ton of carbon dioxide equivalent.⁴ The basic unit of one ton of carbon dioxide equivalent shows up throughout academic and government writing related to the establishment of any emissions trading systems. Therefore, it is to be expected that the standard unit internationally for trade in greenhouse gas emissions will be based upon one ton of carbon dioxide equivalent.

As indicated previously, six different greenhouse gases contribute significantly to global warming. If an emission trading system is to incorporate all of these greenhouse gases, it is necessary that there be a mechanism for converting between the various greenhouse gases. This is why the basic unit has been described as a metric ton of “carbon dioxide equivalent.” Article 3(j) of the European Union Emissions Trading Directive states that a ton of carbon dioxide equivalent is

³ Directive 2003/87/EC of the European Parliament and of the council of 13 October, 2003 establishing a scheme for greenhouse gas emission allowance trading within the community and amending council directive 96/61/EC, article 3(a).

⁴ Australian Greenhouse Office 1999, National Emissions Trading: crediting the carbon, Discussion paper No. 3 at page 31; and designing the market, Discussion paper No. 4 at page 21, Commonwealth of Australia, Canberra.

one metric ton of carbon dioxide (CO₂) or an amount of any other greenhouse gas listed in Annex 2 with an equivalent global warming potential.⁵

The global warming potential of the various greenhouse gases varies. Therefore, it will take different amounts of each gas to produce the same global warming impact on the environment, as does a metric ton of carbon dioxide. The global warming potential of the different gases are as follows:

Gas Type	Global Warming Potential
Carbon Dioxide	1
Methane	21
Nitrous oxide	310
Sulfur hexafluoride	23,900
Hydrofluorocarbons	140 - 11,700
Perfluorocarbons	6,500 – 9,200

Based on the global warming potential of the different gases, it would take 21 tons of methane to equal the global warming impact of one ton of carbon dioxide. Similarly, it would take 310 tons of nitrous oxide to equal the global warming affect of one ton of carbon dioxide. This means that, under an emissions trading system, it would be necessary to retire 21 emission permits or allowances for each ton of methane emitted while it would only be necessary to retire one emission allowance for each ton of carbon dioxide emitted. Using the example of nitrous oxide, 310 emissions allowances would be required for each ton of nitrous oxide emitted. Although all of the different greenhouse gases will be emitted, monitored and reported, there will still be only one basic unit of

⁵ See Note 3, *supra*, at article 3(j).

⁶ Australian Greenhouse Office 1999, National Emissions Trading: designing the market, Discussion paper No. 4 at page 21, Commonwealth of Australia, Canberra.

trade, that of the metric ton of carbon dioxide, upon which all the various emissions permits and allowances are based.

The final aspect of the types and quantities of greenhouse gases to be dealt with is the difference between emissions and sequestration. Article 3.3 of the Kyoto Protocol states that both greenhouse gas emissions by sources and removals by sinks can be used to meet emissions commitments.⁷ A sink is created when a greenhouse gas is deposited or sequestered in such a way as to remove it from the environment, thereby also removing the global warming potential of that carbon.

There are many different types of carbon sink that could be used to store carbon, such as the growth of forests or vegetation and depositing carbon within soil or rock. However, the international consensus with respect to carbon sequestration still appears to be to use the basic unit of a metric ton of carbon dioxide equivalent, as was the case with the emissions of greenhouse gases. Therefore, in contrast to the definition of an “allowance to emit” one ton of carbon dioxide equivalent, a “carbon credit” could be issued for each ton of carbon dioxide equivalent that is sequestered or otherwise stored in a carbon sink. Although an allowance to emit and a carbon credit deal respectively with discharging carbon into the environment as opposed to removing carbon from the environment, both would still be based upon the same unit of measurement. Both an allowance to emit and a carbon credit therefore refer to one ton of carbon dioxide equivalent.⁸

⁷ See note 1, *supra*.

Overall, there is a clear consensus that there is, and should be, one basic unit upon which all emissions trading is based. That basic unit is the metric ton of carbon dioxide or its equivalent. Furthermore, that basic unit remains the same whether the carbon dioxide is being emitted into the environment or being removed from the environment by way of sequestration. Finally, it is the global warming potential of one metric ton of carbon dioxide that is the relevant unit of trade. This global warming potential can be converted into any of the six greenhouse gases by the use of a multiplier based on the global warming potential of each gas. In this way, even though the different gases are being emitted, the trading system is still based upon that initial unit of trade, being the global warming potential of one metric ton of carbon dioxide or its equivalent.

2. Term of Validity of an Allowance or Credit

In defining an emission allowance or a carbon credit, an important factor will be the lifespan or the term during which the allowance or credit will be valid. Another important issue will be to determine whether allowances or credits can be “banked,” or put away to be used during a future term. There are a number of different examples of terms given to emissions allowances under existing emission control and emission trading systems. In Australia, the *Ozone Protection Act, 1989* controls the manufacture, import and export of ozone depleting substances through a system of quotas and licenses. Quotas on the manufacture, import and export of ozone depleting substances are set on a two-year basis. Similarly, licenses to manufacture, import or export under those quotas

⁸ Australian Greenhouse Office 1999, National Emissions Trading: crediting the carbon, Discussion paper No. 3 at page 30-31, Commonwealth of Australia, Canberra.

are issued for a two-year term.⁹ Similarly, the *Ontario Environmental Protection Act Emissions Trading Regulation* allocates nitrous oxide and sulfur dioxide allowances on an annual basis. As well, emission reduction credits can be claimed for emission reductions that take place during a one-year accumulation period. Finally, the Ontario Emissions Trading Code allows emission reduction credits to be created up to seven years after the implementation of an emissions reduction project. The regulation and the Ontario Emissions Trading Code also indicate that emission reduction credits and emission allowances can be banked indefinitely. In other words, the emission reduction credits and emission allowances can be kept back and used in future years.¹⁰

Article 3.1 of the Kyoto Protocol deals with emissions allowances and emission reductions over a five-year commitment period. The first such commitment is to run from 2008 to 2012.¹¹ A five-year commitment period was used in the Protocol, as opposed to a single target year, in order to allow for annual fluctuations in emissions from such things as changes in the weather or economic cycles. This allows a party to average their emissions over the five years of the commitment period.¹² Under the European Union Emission Trading Directive, Articles 10 and 11.1 state that allowances will be allocated for a three-year period beginning January 1, 2005 and for a five-year period beginning January 1, 2008. However, article 12.3 of the Directive requires that emissions allowances equal to the total emissions from the installation be surrendered on

⁹ Commonwealth of Australia, *Ozone Protection and Synthetic Greenhouse Gas Management Act, 1989* sections 8 and 8A.

¹⁰ *Environmental Protection Act* R.S.O. 1990, c.E-19 Emissions Trading O. Reg. 397/01; and Ontario Emissions Trading Code, Government of Ontario, Air Policy and Climate Change Branch, Ministry of the Environment, January 2003.

¹¹ See Note 1.

an annual basis.¹³ As a result, although the emissions allowances will be received for a three or five-year period, it will be necessary to reconcile the actual emissions to the allowances held on an annual basis.

In determining the lifespan or term of an emission allowance or carbon credit, it will be important that there be regular measurement and monitoring of both the actual emissions and the amount of carbon that is sequestered. It will also be very important to verify that the sequestered carbon has been retained in that state.¹⁴ This becomes more important the longer the life of the sequestered carbon project or the longer the amount of time before the next allocation of emissions allowances. For example, if a carbon sequestration project is expected to have a 20-year life span but, due to unforeseen circumstances, that carbon is lost in the second year, there will be significant effects if the carbon credits are not adjusted promptly. Similarly, if emissions allowances are allocated every five years and a party holds insufficient allowances to meet their actual emissions, it will be important for that shortfall to be determined as quickly as possible. Therefore, regardless of the length of the term or commitment period, it will be important to verify the status of both carbon credits and emission allowances at regular intervals during that commitment period.¹⁵

¹² Caring for Climate: a guide to the Climate Change Convention and the Kyoto Protocol, Climate Change Secretariat (UNFCCC) Bonn, Germany 2003.

¹³ See note 3 at articles 10, 11.1 and 12.3.

¹⁴ See note 8 at page 33.

¹⁵ COP6 Viewpoints: Permanence of LULUCF CERs in the Clean Development Mechanism. Dr. Suzi Kerr and Catherine Leining, Centre for Clean Air Policy, 2000.

As indicated previously, the Kyoto Protocol allows for emissions allowances to be allocated over a five-year commitment period but requires the actual emissions to be reported on an annual basis. This allows for longer term planning and variations from year to year while at the same time ensuring that the actual situation and emissions levels are monitored regularly.¹⁶ An annual surrender or reconciliation of actual emissions to emissions allowances and carbon credits will also help prevent noncompliance before it actual occurs. Regular reconciliation will require parties to balance their allowances and credits on a regular basis and, therefore, provide more current and accurate information to all parties involved. The more current and accurate information is, the more confidence the trading parties are likely to have in the market place.¹⁷ This confidence in the market will lead, in turn, to a more stable, robust market.

The final issue with respect to the term of validity of an allowance or credit is the ability to “bank” or retain an allowance or credit for future use. The Kyoto Protocol does provide that where a party’s emissions during the commitment period are less than its required level of emissions, it may carry over or “bank” its unused emissions for the next commitment period. However, the Kyoto Protocol does not allow banking of carbon credits earned from removing carbon by sinks. As well, carbon credits that are earned from Joint Implementation and Clean Development Mechanism projects can only be banked to a maximum of 2.5% of a party’s assigned emission amounts.¹⁸

¹⁶ see note 8 at page 39 and note 6 at page 22.

¹⁷ Recommendations on the Implementation of International Emissions Trading and Related Inventory, Reporting, Review and Compliance Procedures and Mechanisms. Ned Helme, Tim Denne and Tim Hargrave, Centre for Clean Air Policy Submission to the UNFCCC Secretariat, January 31, 2000.

Articles 13.2 and 13.3 of the European Union Emission Trading Directive allow for the reissue of allowances that are no longer valid but that were surrendered or cancelled at the end of the prior term.¹⁹ This will have the same impact as banking since a party that had excess emission allowances at the end of an accounting period can have those excess allowances reissued in the next accounting period. Obviously, the ability to bank allowances and credits will create much greater flexibility within any emission trading system. Parties will be able to retain unused allowances or credits to guard against unexpected future emissions increases or such things as production increases. The value and tradability of allowances and credits will also be increased if they have a longer lifespan. It is unlikely that there will be much trading activity in allowances and credits if they simply expire at the end of the current accounting period. This is especially so if the accounting period is brief.

Another issue that is very similar to the banking of allowances and credits is whether allowances or credits will be available for purchase prior to their actual term of validity. For example, if allowances were auctioned prior to their usable year, parties would be able to participate in a futures and options market.²⁰ Being able to enter into contracts to buy or sell allowances or credits for the future would enable parties to effectively insure themselves against future price changes.²¹ However, allowing this type of futures market trading could be problematic in that it may result in allowances and credits being

¹⁸ See note 12 at page 17.

¹⁹ See note 3.

²⁰ Tradable Carbon Allowance Auctions: How and Why to Auction, Peter Cramton and Suzi Kerr. Centre for Clean Air Policy, March 1998 at page 4.

²¹ See note 6 at page 22.

purchased that, in the end, never come into being. This will create uncertainty that could undermine the credibility of the entire emissions trading market.

The issue of whether or not to allow banking of allowances and credits is one that has essentially no associated environmental costs. Banking will only be permitted with existing allowances and credits; therefore, there will be no additional carbon or carbon dioxide equivalent emitted into the environment. As well, the lifespan of carbon dioxide equivalents in the atmosphere is so long that any short term banking of allowances and credits will have little or no impact. At the same time, the emissions trading market will be able to function much effectively with banking because it will result in allowances and credits being treated equally once they have been issued.²² Provided that the allowances and credits are monitored and verified to ensure their validity, it seems unlikely that there will be any negative impacts associated with banking. On the other hand, allowing a market or trading in unissued or unverified allowances and credits carries a significant degree of risk and uncertainty in that those allowances and credits may never exist.²³

3. Types of Permits, Allowances and Credits

Under the Kyoto Protocol, there will be five different tradable instruments available under an emission trading system. Those tradable instruments will be as follows:

- (a) assigned amount units from domestic sources (AAU);

²² See note 6 at page 4.

²³ See note 6 at page 22.

- (b) carbon credits for sequestered carbon;
- (c) assigned amount units from foreign sources;
- (d) emission reduction units from joint implementation projects (ERU); and
- (e) certified emission reduction from clean development mechanism projects (CER).

Legally binding emission targets are the central foundation upon which the Kyoto Protocol is based. By taking the step of ratifying the Kyoto Protocol, parties agree to limit their greenhouse gas emissions to a certain percentage of their emissions during the year 1990. Although it is expected that parties will have to make significant emission reductions to meet their targets, parties may also offset their emissions through other mechanisms available under the Kyoto Protocol. For example, parties may purchase Assigned Amount Units from other countries or they may offset their emissions with carbon credits, Emission Reduction Units and Certified Emission Reductions.²⁴ The availability of these other mechanisms to offset omissions allowances will enable parties to pursue the most cost effective means of reducing their emissions. For example, if it is cheaper to purchase AAUs from another country, or to sequester carbon in a carbon sink than it is to make the actual emission reductions, parties will look to the market place as a means of purchasing allowances to meet their emission requirements.²⁵

(a) Domestic Assigned Amount units

²⁴ See note 12 at page 17.

²⁵ See note 12 at page 20.

As indicated previously, article 3.1 of the Kyoto Protocol states that certain parties to the Protocol will receive “assigned amounts” (AAUs) to which they are bound to limit their emissions. It is important to note that AAUs will exist solely because the Kyoto Protocol created them and that they cannot be created in any other way.²⁶ Article 3.7 of the Protocol states that during the first commitment period, from the years 2008 – 2012, parties listed in Annex B will be limited in their greenhouse gas emissions to a specified percentage of their emissions from the year 1990, multiplied by 5 to represent the entire commitment period.²⁷

Like the Kyoto Protocol, existing emission trading or control systems also set a limit on how much of controlled substances can be emitted. Along with the maximum amount of emissions, existing programs also have a mechanism whereby the emissions allowances are allocated to participating parties. For example, the *Australian Ozone Protection Act* licenses parties to manufacture, import or export ozone-depleting substances and allocates a quota or specific amount of those ozone-depleting substances to each licensee. The *Ozone Protection Act* also specifically authorizes the Government to terminate licenses as required to give effect to international obligations or to cancel licenses with cause.²⁸

²⁶ The Kyoto Protocol and the WTO: Integrating Greenhouse Gas Emissions Allowance Trading into the Global Marketplace, 10 Duke Envtl. L. & Pol’y F. 185 at 197.

²⁷ See note 1.

²⁸ See note 9, sections 7-20.

At the state level in Australia, New South Wales has created two systems addressing greenhouse gas emissions. The *Protection of the Environment Operations Amendment (Tradeable Emissions Schemes) Act* allows for the creation of tradable emission permits or credits and for the holding of those permits or credits by the public. The legislation also requires that there be some combination of a limit on total emissions, a scheme to offset pollution or a program to surrender the permits and credits over time.²⁹ In the *Amendment of Electricity Supply Act*, the government of New South Wales assigns a greenhouse gas “benchmark” to electricity producers. The electricity producers are then penalized if their emissions exceed their benchmark. Although this system does not create a tradable emission instrument, other parts of the Electricity Supply Act allow for the creation of “abatement certificates.” Therefore, although the electricity producers cannot trade their ability to emit greenhouse gases, they are able to receive certificates for abating or reducing their emissions below their benchmark. These abatement certificates can then be traded.³⁰

In North America, the best-known emissions trading system is the acid rain reduction system used in the northeastern United States and Ontario. Under the Ontario Emissions Trading Regulation, electricity generation facilities are allocated nitrous oxide or sulfur dioxide emission allowances by the government. The electricity generation facilities are required to balance their actual emissions with their emission allowances and emission reduction credits. However, a unique feature of the Ontario system is that emitters

²⁹ *Protection of the Environment Operations Amendment (Tradeable Emission Schemes) Act*, 2000 No. 91, Government of New South Wales, Commonwealth of Australia. Sec. 295B.

³⁰ *Electricity Supply Amendment (Greenhouse Gas Emission Reduction) Act*, 2002, No. 122, Government of New South Wales, Commonwealth of Australia, Sec. 97BC.

receive only get partial credits for emission reduction credits. Specifically, no more than 33 percent of their emissions may be offset by emission reduction credits and only 90% of the emission reduction credits can be applied to their actual emissions.³¹

In the case of the European Union, article 6 of the Emissions Trading Directive states that greenhouse gas emissions permits will be issued if the installation operator is capable of monitoring and reporting its emissions. In addition, each greenhouse gas emissions permit shall specify that the holder has an obligation to surrender allowances equal to its emissions in each calendar year.³² This creates a two-streamed process in that participants must receive a permit to be allowed to emit and an allowance that specifies what amount they may emit. Furthermore, while the allowances are transferable, the permits are not. Permits will be associated only with a specific installation.³³ Article 9 of the directive requires that each member state develop a National Allocation Plan that sets out the quantity of allowances that it will allocate and how it will allocate them.³⁴

As can be seen, one of the aspects of emissions allowances or credits that is seen in all systems is for the maximum number of those allowances to be set by the responsible authority. In the case of the Kyoto Protocol, the number of allowances will be capped by an individual nation's Kyoto commitment. However, the emissions allowances or permits themselves will be issued by an individual nation's government. It is these

³¹ See note 10, section 7 – 15 and 21.

³² See note 3, Article 6.

³³ Explanatory Memorandum, Proposal for a Directive of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, COM (2001) 581 final, Brussels, 23.10.2001, at p. 3.

³⁴ See note 3, Article 9.

individual emission permits or allowances that will become the internationally tradeable unit under the Kyoto Protocol. Each emissions allowance will authorize the holder to emit one metric ton of carbon dioxide equivalent.³⁵ Another common aspect of the emissions trading scheme is that, although each regulated entity must meet its emissions cap within a specified time period and must report those emissions, the regulated entities are generally left to decide for themselves exactly how they will comply with their emissions cap.³⁶

The next issue that arises with respect to emissions allowances and permits is the obligation to surrender or acquit those permits. A general feature of trading systems is that, at some specified time period, the holders of allowances and permits must surrender those allowances and permits. Generally speaking, they are required to surrender or acquit the same number of allowances as their actual emissions. In this way, participants can be monitored to ensure that their emissions do not exceed their limits or commitments. It is only when a participant's emissions exceed their allowances or permits that compliance and punitive mechanisms will come into play.

The final issue with respect to emission allowances and permits is to determine their legal status. In other words, what rights and obligations does possession of an allowance or permit create and to what extent does holding such a permit or allowance create a property or ownership right for the holder.

³⁵ see note 8 at pages 30-31; and note 5 at page 22.

A common argument made by greenhouse gas emitters is that, prior to the establishment of emission control policy and legislation, there were no restrictions on the emitter's ability to emit greenhouse gases. Therefore, it has been argued that this ability to emit may constitute a property "right to emit" or an implicit "license to emit." Once government removes that ability to emit freely and replaces it with a limited number of permits to emit, the ability to emit suddenly has a marketable value. Therefore, it has been argued that government should be compelled to compensate emitters for removing their free ability to emit and replacing it with a limited permit to emit that has an associated cost.³⁷ However, there are a number of inherent problems with the argument that previous greenhouse gas emitters have a right to continue to emit and a right to further free emissions or compensation for lost emissions. For example, it has long been an accepted principle that polluters should pay for their pollution. Therefore, it is only appropriate that greenhouse gas emitters now be required to incur a cost for emitting into the atmosphere. As well, since those emissions are discharged into the communally owned atmosphere, it is only fair that the community charge a cost for those emissions. In addition, the emission limitations under the Kyoto Protocol will apply to entire nations, regardless of the date that the emitter commenced emissions. Therefore, it is only logical that the allocation of emission restrictions be made on a nation-wide basis and not solely to "historic" emitters.³⁸ Finally, the Kyoto Protocol is essentially an international trade agreement. As with other international trade agreements, there can be impacts on tariff policy that result in additional costs to businesses within a nation. As

³⁶ US Carbon Emissions Trading: Some Options that Include Downstream Sources, David Festa, Centre for Clean Air Policy, April 1998 at page 9.

³⁷ Greenhouse Gas Emissions Trading: Allocation of permits, the Allan Consulting Group report to the Australian Greenhouse Office, Commonwealth of Australia, August 2000.

this type of change in tariff policy is not considered to require compensation, similarly restrictions on emissions allowances due to the effect of the Kyoto Protocol should not be seen as a measure requiring compensation.³⁹

Logically, if the ability of emitters to emit greenhouse gases prior to the implementation of an emission restriction is not sufficient to create a property right out of their ability to emit, then the next question becomes whether the new allowance or permit to emit should, in itself, be treated as a property right. The acid rain emissions trading regime in the northeastern United States is covered by the *U.S. Clean Air Act*. In defining the nature or emissions allowance, the act states the following:

An allowance allocated under this subchapter is a limited authorization to emit sulfur dioxide in accordance with the provisions of this subchapter. Such allowance does not constitute a property right. Nothing in this subchapter or in any other provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization.⁴⁰

The original proposal for this definition was to make the emission permit a “property right protected from government taking under the Fifth Amendment.”⁴¹ However, the creation of a property right was strongly opposed. There were concerns from utility regulators that the creation of a property right in emissions would impact their ability to regulate those utilities. Environmental groups were concerned that the creation of such a property right would give the emitter the “right to pollute” and therefore the ability to fight attempts at future pollution control. There was also a concern that the creation of a

³⁸ See note 6 at page 29-30.

³⁹ See note 37 at page 25.

⁴⁰ United States Code Collection Title 42, Chapter 85, subchapter iv-A, section 7651B.

⁴¹ Emissions Allowance Trading Under the Clean Air Act: A Model for Future Environmental Regulations?, Jeffrey M. Hirsch, NYU Environmental Law Journal, Volume 7, 1999, page 352 at 382

property right would impact the ability to regulate the emission trading market in the future.⁴² In the end, the existing definition was granted which, instead of a property right, created a limited authorization to emit and specifically and intentionally stated that this authorization was not a property right. The result is that emission allowances under the *Clean Air Act* are a combination of public and private property rights. For example, the holder of an emission allowance can prevent everyone, except the government, from interfering with their emissions allowances, which gives the emission allowances some of the characteristics of a private property right. On the other hand, the government has retained the ability to allocate, terminate or limit those emissions allowances, which clearly limits the private property aspects of the allowances. Therefore, while it is clear that the holder of an emission allowance has some valuable interest or right in those allowances, the holder's authority over those emissions allowances is limited by the authority of the government.⁴³

One thing that is generally agreed upon is that it is important to define clearly the tradeable instrument for use in emissions trading. Unfortunately, the content of that definition either varies widely or is not given at all. It is important that all parties clearly understand the tradeable unit so that it can be traded effectively on a national or international level. Similarly, it will be virtually impossible to enforce emission allowances if it is not clearly understood what rights or liabilities those allowances confer upon the holder. On the other hand, the degree to which an emissions allowance should confer a property right upon the holder is less certain. Clearly, the success of the U.S.

⁴² See note 41 at 383.

Acid Rain Program demonstrates that it is not necessary for an emissions allowance to constitute an unalienable property right upon the holder. In fact, the general consensus in the legislation enacted to date appears to be that what will be conferred on a holder is a limited authorization to emit greenhouse gases, rather than a right to produce those emissions. Furthermore, in order that governments can continue to adapt and adjust to climate change, it is necessary that they retain sufficient control over emissions allowances to adjust those allowances as needed. This is especially true since emissions allowances for future commitment periods under the Kyoto Protocol remain to be negotiated.

(b) Carbon Credits for Sequestered Carbon

Article 2.1 of the Kyoto Protocol reads, in part, as follows:

- (1) each party included in Annex 1, in achieving its quantified emission limitation and reduction commitments under article 3, in order to promote sustainable development, shall:
 - (a) implement and/or further elaborate policies and measures in accordance with its national circumstances, such as:
 - (ii) protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol, taking into account its commitments under relevant international environmental agreements; promotion of sustainable forest management practices, afforestation and reforestation;
 - (iii) research on, and promotion, development, and increased use of, new and renewable forms of energy, of carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies;

⁴³ Clearing the Air: Four Propositions about Property Rights and Environmental Protection, Daniel H. Cole, Ten Duke Environmental Law and Policy Forum, Page 103 at 113-114.

Article 3.3 states as follows:

The net changes in greenhouse gas emissions by sources and removals by sinks resulting from direct human induced land-use change in forestry activities, limited to afforestation, reforestation and deforestation since 1990, measured as verifiable changes in carbon stocks in each commitment period, shall be used to meet the commitments under this article of each party included in Annex 1. The greenhouse gas emissions by sources and removals by sinks associated with those activities shall be reported in a transparent and verifiable manner and review in accordance with articles 7 and 8.⁴⁴

Article 3.4 of the Kyoto Protocol goes on to require parties to estimate the level of their carbon stocks in 1990 and to estimate changes in carbon stocks in subsequent years.

Finally, article 3.7 of the protocol requires that those:

parties included in Annex 1 for whom land-use change in forestry constituted a net source of greenhouse gas emissions in 1990 shall include in their 1990 emissions base year or period the aggregate anthropogenic carbon dioxide equivalent emissions by sources minus removals by sinks in 1990 from land-use change for the purposes of calculating their assigned amount.⁴⁵

These provisions of the Kyoto Protocol allow parties to include carbon that has been sequestered in carbon sinks in determining their total carbon stocks and also in meeting their emissions allowances. However, the precise details of the use of carbon sinks and land-use and land-use change and forestry in meeting emissions allowances has not yet been fully defined. These issues are some of the most contentious issues that are discussed and negotiated at the annual Conference of the Parties' meetings. The seventh Conference of the Parties was held at Marrakesh from October 29 to November 10, 2001. It was expected that this conference would result in clear rules and requirements for the

⁴⁴ See note 1, *supra*.

use of carbon sinks. Although these clear rules and requirements were not forthcoming from the conference, significant progress was made towards clarifying the use of carbon sinks under the Kyoto Protocol. These decisions have become known as the “Marrakesh Accords.”

One important element of the agreement reached in the Marrakesh Accords was a set of principles to govern land-use, land-use change and forestry activities. These principles require land-use, land-use change and forestry activities to be based on such things as sound science, consistent methodology, conservation of biodiversity, sustainable use of natural resources, and proper accounting for changes in carbon levels as a result of land-use, land-use change and forestry activities.⁴⁶ The Marrakesh Accords also include definitions of such things as forest, afforestation, reforestation, deforestation and so on.⁴⁷ The Marrakesh Accords expand the activities that parties can account for to help them meet their emission targets. Under the Kyoto Protocol, parties are required to account for carbon emissions and removals from afforestation, reforestation and deforestation activities. The Marrakesh Accords expand that list to include forest management, cropland management, grazing land management, and revegetation. However, parties must decide in advance whether they will account for these additional activities in meeting their emission targets. Once that choice has been made, the parties must abide by that decision throughout the entire commitment period.⁴⁸ As a result, parties can use

⁴⁵ See note 1, *supra*.

⁴⁶ Report of the conference of the parties on its 7th session, held at Marrakesh from 29 October to 10 November, 2001, Decision 11/CP.7, FCCC/CP/2001/13/ADD.1 page 56

⁴⁷ See note 46 at page 58.

⁴⁸ See note 12 at page 23. Also, see Issues in the Negotiating Process: Land-use, land-use change and forestry under the Kyoto Protocol, <http://unfccc.int/issues/lulucf.html> at page 4.

their LULUCF activities that remove carbon or reduce emissions towards meeting their emission targets. The amounts of carbon that are removed or reduced will be reflected by issuing removal units (RMUs) that can be applied towards emission targets.⁴⁹

The final thing that was accomplished in the Marrakesh Accords was to create a four-tier capping system that limits the use of LULUCF activities in meeting emission targets during the first commitment period. The capping system is as follows:

Tier 1 – If afforestation, reforestation and deforestation activities result in net emissions rather than removals, a party may use forest management activities to offset those emissions. However, this offset is only to a maximum of nine megatons of carbon per year during each year of the commitment period.

Tier 2 – Beyond the nine-megaton limit set out in tier 1, parties will be subject to an individual “cap” on the amount of forest management activities that can be used to meet their emission targets.⁵⁰ There will be a global cap of 83 million tons of carbon per year for credits for forest management that can be claimed by Annex 1 countries.⁵¹

Tier 3 – Parties may use emissions and removals from cropland management, grazing land management and revegetation to meet their emission targets.

⁴⁹ See note 12 at page 23.

⁵⁰ Issues in the Negotiating Process: Land-use, land-use change and forestry under the Kyoto Protocol, <http://unfccc.int/issues/lulucf.html> at page 5.

⁵¹ COP6-BIS: Implications for the Kyoto Protocol, the U.S and other countries, Perspectives from the Centre for Clean Air Policy by Catherine Leining, Ned Helme, Kathleen Kelly and Elina Levina, July 2001 at page 6.

However, only the net changes in carbon stocks compared to the base year of 1990 can be used.⁵²

Tier 4 – Under the Kyoto Protocol’s Clean Development Mechanism, only afforestation and reforestation projects will be eligible.⁵³

Article 30 of the European Union Emission Trading directive is titled “Review and Further Development.” Article 30.2 reads, in part, as follows:

On the basis of experience of the application of this directive and of progress achieved in the monitoring of emissions of greenhouse gases and of the light of developments in the international context, the commission shall draw up a report on the application of this directive, considering:

(d) the use of credits from project mechanisms⁵⁴

As can be seen, this directive does not specifically allow for the use of carbon credits or removal by sinks in meeting targets or emissions trading. There is currently a proposal before the Commission of European Communities to amend the Emission Trading Directive in order to accommodate the joint implementation and clean development mechanisms in the Kyoto Protocol. In the Explanatory Memorandum that prefaces the proposed amendments, the issues of land-use, land-use change and forestry activities and the sequestration of carbon are discussed. The position taken by the commission of European communities is that any carbon storage by way of land-use, land-use change and forestry is inherently temporary. As a result, the European Union’s emissions trading scheme will not recognize such activities as credits towards meeting emissions targets. The commission takes the position that the emissions trading scheme is intended to

⁵² See note 50 at page 5.

⁵³ See notes 50 and 51.

⁵⁴ See note 3.

encourage and enhance long-term emission abatement. Furthermore, meeting emission targets by the storage of carbon in sinks is not consistent with emission abatement improvements. The Commission goes on to point out that there are too many uncertainties with respect to how to monitor and account for emission removal by sinks. The Commission notes that sink projects are expected to be less expensive than development of new technology and, therefore, would be likely to divert funding that would otherwise go towards researching new technology or the transfer of new technology. Again, this result is not consistent with long-term emission abatement. However, the commission comments that once the United Nations Framework convention on climate change reaches an agreement with respect to carbon sinks, the European Union will reconsider based on that agreement.⁵⁵ In the press release detailing the proposed amendments to the European Union Directive, the Commission Pressroom notes that the issue of carbon sinks has been a contentious issue at the UN due to the fact that such sinks are temporary and reversible and do not bring about technology transfer. As well, there remains some uncertainty with respect to the long-term affects of emissions removal by carbon sinks.⁵⁶

As can be seen, the provisions of the Kyoto Protocol dealing with carbon sinks and the associated rules and decisions are extremely controversial and complicated. For example, a “Kyoto forest” would be only those forests that have been afforested, reforested or deforested since 1990. To be applicable towards emissions targets under the

⁵⁵ Proposal for a Directive of the European Parliament and of the Council amending the Directive establishing a scheme for greenhouse gas emission allowance trading within the community, in respect of the Kyoto Protocol’s project mechanisms, COM(2003)403 final, Brussels, July 23, 2003 at page 10.

⁵⁶ EU Institutions press releases memo/03/154 Brussels, 23 July 2003, Kyoto Protocol at page 4.

Kyoto Protocol, it is only the emissions or sequestrations that take place during the Kyoto commitment period in those forests that underwent changes since 1990 that will apply.⁵⁷

In order to determine whether carbon sequestration or emissions in a forest will apply to a Kyoto emission target, it will be necessary to determine the following:

- (1) whether the particular vegetation qualifies as a “forest” within the definition of the Kyoto Protocol;
- (2) whether there has been afforestation, reforestation or deforestation in that forest as those terms are defined under the Kyoto Protocol;
- (3) the amount of carbon that was sequestered in the forest at the beginning of the commitment period; and
- (4) the amount of further carbon that was sequestered or emitted from the forest during the commitment period.

Added into this complexity is the nature of a forest as a carbon sink and the fact that there is no guarantee that the level of carbon will either increase at a steady rate or remain sequestered at all. Many natural events can result in the loss of all or part of a forest. Under the Kyoto Protocol, this loss would qualify as a carbon emission and would therefore need to be accounted for under Kyoto emission targets.

Although the sequestration of carbon in a sink is a very different issue from greenhouse gas emissions, there are some similarities or overlaps when establishing a crediting system. For example, a “carbon credit” will be issued by the government in much the same way as would be an emission permit. While the supply of emission permits would be capped by a nation’s Kyoto commitment, the supply of carbon credits is theoretically

⁵⁷ See note 8 at page 24.

limited only by the amount of eligible carbon sinks. A carbon credit would be issued only when it has been verified that one ton of carbon dioxide equivalent was sequestered in the carbon sink. Since the basic unit is once again the metric ton of carbon dioxide equivalent, a carbon credit would be substitutable for an emission permit. Either one would allow the holder to emit one ton of carbon dioxide equivalent. However, if the carbon is no longer sequestered in the carbon sink, for example due to deforestation or a natural event such as a forest fire, then any previously issued carbon credits with respect to that sequestered carbon must be surrendered.⁵⁸

One of the biggest issues with respect to sequestered carbon and carbon sinks is that of the permanence and reversibility of carbon sinks. As discussed above, there is an inherent potential for sequestered carbon to be released at a later date, whether intentionally or unintentionally. As a result, it is necessary that there be monitoring of the status of carbon in a sink and also future liability for that carbon if it is released from its sequestration. With respect to the original issuance of credits for carbon in sinks, it is important that there be strict monitoring and verification requirements before a credit will be issued. It is also important that there be ongoing regular measurement and monitoring of that sequestered carbon to ensure that it remains in its sequestered state. If there is strict and transparent monitoring and verification of the sequestration of carbon, then it is more likely that the resulting carbon credits will be reliable and therefore marketable in an emissions trading system.⁵⁹

⁵⁸ See note 8 at pages 30-31.

⁵⁹ See note 8 at page 33 and note 15 at page 1.

For carbon that is being sequestered in vegetation, a point is eventually reached at which no further increase in the sequestered carbon will occur because the vegetation has reached maturity. At that point, no further carbon credits will be issued for that specific vegetation. However, the vegetation should continue to be monitored to determine whether any of the carbon is released at a later date and if carbon credits must be surrendered accordingly.⁶⁰

If and when sequestered carbon is released from a sink for which carbon credits have been issued, it will be necessary for an equivalent number of carbon credits or emissions allowances to be surrendered. However, where the initial carbon credits have been sold, transferred or surrendered for other emissions obligations, the question becomes who will be responsible for the carbon that has now been released. One option would be for credits issued for sequestered carbon to be identified with respect to a specific carbon sink. If the carbon is later released into the environment, the carbon credits with respect to that specific carbon will be invalidated. Such a system would place the liability for those carbon credits upon the purchaser or buyer of the credits, rather than on the original seller.⁶¹ While such an approach may be appropriate under the Clean Development Mechanism with a seller located in a developing country, this may not hold true for sequestered carbon in the developed nations. If the buyer of a carbon credit has the potential liability for surrendering that credit as a result of circumstances beyond his control, it seems highly unlikely that there will be any interest in purchasing such a credit. As a result, these carbon credits would not have the same value and marketability

⁶⁰ See note 8 at page 40.

⁶¹ See note 15 at page 3.

as other trading units in the emissions trading system. This in turn, would discourage activities aimed at sequestering carbon since the resulting credits will not have a market.

The final issue with respect to carbon credits for sequestered carbon in sinks is the legal status or form of ownership that passes with such a carbon credit. At the state level in Australia, there are a number of examples of legislation that create a transferable right in sequestered carbon.

The state of New South Wales, Australia enacted the *Carbon Rights Legislation Amendment Act* in 1998. Schedule 1 of the act is an amendment of the *Conveyancing Act*, 1919 No.6. Section 87A contains the following definitions:

carbon sequestration by a tree or forest means the process by which the tree or forest absorbs carbon dioxide from the atmosphere;
carbon sequestration right in relation to land, means a right conferred on a person by agreement or otherwise to the legal, commercial or other benefit (whether present or future) of carbon sequestration by any existing or future tree or forest on the land after 1990;

forestry right, in relation to land, means:

(a) an interest in the land pursuant to which a person having the benefit of the interest is entitled:

(i) to enter the land and establish, maintain and harvest (or to maintain and harvest) a crop of trees on the land, or

(ii) to enter the land and establish, maintain and harvest (or to maintain and harvest) a crop of trees on the land and to construct and use such buildings, works and facilities as may be necessary or convenient to enable the person to establish, maintain and harvest the crop, or

(b) a carbon sequestration right in respect to the land, or

(c) a combination of the interest and right referred to in paragraphs

(a) and (b).

Section 88AB(2) of the act reads as follows:

If a forestry right consists in whole or in part or a carbon sequestration right, the profit a prendre deemed to exist by subsection (1) in relation to the carbon sequestration right consists of the following:

- (a) the profit from the land is taken to be the legal, commercial or other benefit (whether present or future) of carbon sequestration by any existing or future tree or forest on the land that is the subject of the carbon sequestration right,
- (b) the right to take something from the land is taken to be the right to the benefit conferred by the carbon sequestration right.⁶²

The definition of a carbon sequestration right in the New South Wales legislation has the effect of creating a legal separation between any benefit derived from the carbon sequestration and the actual trees and carbon. In other words, in order to be entitled to any benefit from sequestering the carbon, it is not also necessary that the same individual actually own the trees that contain the carbon. This definition therefore enables the benefit of the sequestered carbon to be sold or transferred separate and apart from the trees under an emissions trading scheme. Similarly, a forestry right that consists of a carbon sequestration right is deemed to be a profit a prendre. The definition indicates that the “profit” is the benefit of the carbon sequestration and the “right to take” from the land is the right to take that benefit. Once again, this has created a legal carbon sequestration right that can be held separately from ownership to the actual trees. Therefore, both the carbon sequestration right and the forestry right could also be traded pursuant to an emissions trading scheme.

In the state of Queensland, the *Forestry Act* defines carbon sequestration as “for a tree or vegetation, includes the process by which the tree or vegetation absorbs carbon dioxide

⁶² *Carbon Rights Legislation Amendment Act 1998* No. 124 and *Amendment of Conveyancing Act, 1919* No. 6, Government of New South Wales, Commonwealth of Australia.

from the atmosphere.” The Act also defines a “natural resource product” as including carbon stored in a tree or vegetation and carbon sequestration by a tree or vegetation.⁶³

Under the Tasmanian *Forestry Rights Registration Act*, “carbon sequestration” and “carbon sequestration right: are given the same definition as under the New South Wales Legislation. In addition, a forestry right is defined as any combination of interests in land including ownership of trees, a carbon sequestration right and a right to establish, maintain or harvest, or maintain and harvest trees. The Tasmanian legislation also defines “forestry rights” that include carbon sequestration rights as a profit a prendre that consists of “the legal, commercial, or other benefit (whether present or future) of carbon sequestration by any existing or future tree or forest on the land.”⁶⁴

Finally, the *Victoria Forestry Rights Act, 1996* defines a carbon sequestration right as “a right to commercially exploit carbon sequestered by trees.” Section 12 of that act deals with “carbon rights agreements” and reads, in part, as follows:

- (1) a forestry property owner may enter into an agreement with a person to grant the forestry property owners carbon sequestration right to that person.

However, section 14(2) of the act states that “a carbon rights agreement is deemed not to be an interest in land.”⁶⁵

⁶³ *Forestry Act, 1959* section 61J Queensland Consolidated Act, Queensland, Commonwealth of Australia at section 61J.

⁶⁴ *Forestry Rights Registration Act 1990*, Tasmanian Consolidated Legislation, State of Tasmania, Commonwealth of Australia, at sections 3 and 5.

⁶⁵ *Forestry Rights Act 1996*, Act No. 29/1996, Victorian Legislation and Parliamentary Document, State of Victoria, Commonwealth of Australia, Sections 3, 12, and 14.

As can be seen, the states of Australia have created several different mechanisms in their legislation by which a legal right to the benefit of sequestered carbon has been separated from ownership of either the land or the trees in which the carbon is stored. Australia does not yet have a national emissions trading system and is currently not intending to ratify the Kyoto Protocol. However, it is clear that the steps taken by the various states are intended to pave the way for entering into an emissions trading system and for using carbon sequestered in forests as a means of creating “credits” for use in that system.

In defining a carbon credit and determining the legal elements of that credit, it is important to define the right simply in order that successive interest holders will understand the package of rights they acquire with the carbon credit. It is also important that there be careful monitoring and transparent records to verify that the interests are real and that others can obtain those same interests for free. Without these safeguards, the market in carbon credits will lack credibility and will not be attractive to consumers.⁶⁶ It is also imperative that the carbon in a carbon sink and the interest being transferred be capable of being measured and defined precisely so that there is a solid foundation upon which enforcement of those rights can be based. At the same time, we live in a constantly changing world and it is important that any definition have sufficient flexibility that it is able to be adapted to future and potentially rapid technology change.⁶⁷

Unlike the AAU’s discussed previously, carbon credits are entities that can be “produced” by a party, so long as they are produced in accordance with the requirements

⁶⁶ Expanding the choices for the global commons: Comparing newfangled tradeable allowance schemes to old-fashioned common product property regimes, 10 *Duke Env'tl. L. & Pol'y F.* 45 at page 60-62, Gordon Bradford Tweedy, 1999.

of the Kyoto Protocol and any national carbon crediting system.⁶⁸ Based on all of the above, it is important to ensure that standards for issuing carbon credits are very high and capable of being verified in order to ensure the marketability of any issued credits. Any credits that do not meet with those requirements are unlikely to be sold on a market. For example, if a buyer worries that the validity and stability of this carbon sink will not be maintained, the buyer will also be concerned that the carbon credit it purchases will not remain valid and will lose its value or have to be replaced at the buyer's expense.

(c) Foreign Assigned Amount Units

As discussed previously, AAUs are based on the emissions targets allocated to individual nations pursuant to their Kyoto Protocol commitments. Under an emissions trading system, a nation whose total emission are less than their AAUs can sell the excess. Although such "foreign" AAUs will have been acquired from another source, they will otherwise have all the same characteristics as the "domestic" AAUs discussed previously in this paper.

⁶⁷ Dealing with a Non-Ergodic world: Institutional Economics, Property Rights, and the Global Environment, Douglass C. North, 10 Duke Envtl. L. & Pol'y F. 1 at pages 6 and 11.

⁶⁸ See note 26 at page 197.