

# CARBON: COMMODITY OR CURRENCY? THE CASE FOR AN INTERNATIONAL CARBON MARKET BASED ON THE CURRENCY MODEL

*Jillian Button\**

## I. INTRODUCTION

In an unregulated state, the emission of greenhouse gases (“GHGs”) into the atmosphere in the course of commercial activities such as generating electricity, manufacturing products, and transporting goods is a negative environmental externality. In other words, the natural service the atmosphere provides in absorbing and storing GHGs is not limited and the right to participate in this service need not be bought; the service therefore cannot be priced.

Recent efforts to cap GHG emissions, including the Kyoto Protocol, as well as some governments’ actions, have led to what is commonly referred to as the “commodification of carbon.” This refers to the restriction of GHG emissions, including carbon dioxide (“CO<sub>2</sub>”), and characterization of the right to emit GHGs as a tradable unit which may be transferred or sold. The holder of such a unit can express certain rights in relation to it. The phrase “carbon trading” therefore refers not to trade in physical GHGs as such, but to trading in the right to emit GHGs.<sup>1</sup> Previously freely available to any person, permission to pollute acquires its character as a private asset (as opposed to public wealth) and its exchange value from its scarcity.<sup>2</sup>

As existing carbon markets — including the European Union’s Emissions Trading System (“EU ETS”) and the United Kingdom’s Emissions Trading System (“UK ETS”) — mature, and new markets such as New Zealand’s Emissions Trading Scheme (“NZ ETS”), the Regional Greenhouse Gas Initiative (“RGGI”) and the Western Climate Initiative (“WCI”) develop, there has been a strong push towards global convergence of markets into a global carbon market. Governments outside the EU are considering

---

\* B.A., LL.B. (Hons.) (Melb.); LL.M. Candidate, Harvard Law School, 2008. The author thanks Professor David Wirth of Boston College, as well as Professors Jody Freeman, Howell Jackson, Seung Wha Chang and Byse Fellow Stavros Gadinis from Harvard Law School, for their advice in relation to this note; Michelle Perse from the Harvard Law School Library for her assistance with resources; and the organizers and speakers at the McDermott, Will & Emery 2008 Energy Conference, for sharing their industry perspective on carbon finance. Special thanks go to Tony Judd for proofreading drafts, sending through articles and providing encouragement. Please direct questions or comments to [jbutton@llm08.law.harvard.edu](mailto:jbutton@llm08.law.harvard.edu).

<sup>1</sup> Rutger de Witt Wijnen, *Emissions Trading under Article 17 of the Kyoto Protocol*, in *LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS* 403, 403 (David Free-stone & Charlotte Streck eds., 2005).

<sup>2</sup> Herman E. Daly, *The Return of Lauderdale’s Paradox*, 25 *ECOLOGICAL ECON.* 21, 22 (1998), (citing JAMES MAITLAND, *EARL OF LAUDERDALE, AN INQUIRY INTO THE NATURE AND ORIGIN OF PUBLIC WEALTH AND INTO THE MEANS AND CAUSES OF ITS INCREASE* 57 (2d ed. 1819)).

linking to the EU ETS,<sup>3</sup> and the EU is encouraging these advances. The October 29, 2007 launch of the International Carbon Action Partnership (“ICAP”) indicates that 2008 is likely to mark the beginning of a process of global convergence of carbon markets. ICAP will provide a forum for governments implementing and developing mandatory cap-and-trade markets “to discuss relevant questions on the design, compatibility and potential linkage of regional carbon markets, with the goal of contribut[ing] to the establishment of a well-functioning global cap-and-trade carbon market.”<sup>4</sup> These developments suggest that a new era in regulatory markets is dawning, where cross-border (and ultimately global) emissions trading is likely to develop between currently fragmented markets.

It is becoming obvious that market participation will be driven not only by compliance, but also by speculation.<sup>5</sup> Derivatives transactions based on carbon units will not only be transacted by regulated entities with the aim of minimizing compliance costs and price risk, but also by financial intermediaries looking to profit from the new market. The European Climate Exchange has reported marked increases in the use of options contracts since it launched a European Union Allowances (“EUAs”) options market in October 2006,<sup>6</sup> and the derivatives market is expected to expand further as predicted international linkages between trading systems occur.<sup>7</sup>

In the context of imminent global convergence of different markets, and the forthrightness of the regulated population, it is important for governments to seek consensus as to the legal characteristics of the basic unit of exchange in this market, and the related issue of which market model to adopt. The model ultimately adopted should reflect the economic substance of international emissions trading,<sup>8</sup> while not compromising the environmental integrity of the system. So far, it appears that this matter has not been addressed. While it is agreed that a carbon unit is an “asset,” it is not clear what kind of asset it is, or should be.

The aim of this article is threefold. The first aim is to point out that there is no consensus as to the proper or most desirable legal characterization of a carbon unit, and to discuss some of the more plausible characterizations. Based on general trends, I will argue that a carbon unit is a *sui generis*

---

<sup>3</sup> INTERNATIONAL ENERGY AGENCY, ACT LOCALLY, TRADE GLOBALLY: EMISSIONS TRADING FOR CLIMATE POLICY 123 (2005).

<sup>4</sup> ICAP members consist of European Union members, states of the United States and Canada participating in the RGGI program and the WCI, as well as New Zealand and Norway. See generally ICAP Website, <http://www.icapcarbonaction.com/declaration.htm> (last visited Apr. 1, 2008).

<sup>5</sup> Robert Casamento, *Accounting for and Taxation of Emission Allowances and Credits*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS, *supra* note 1, at 55, 62.

<sup>6</sup> *EU Allowance Prices Hit 15-Week High*, CARBON FINANCE, Oct. 16, 2007; Lance Coogan, *Opportunity Knocks*, CARBON FINANCE, Aug. 20, 2007.

<sup>7</sup> Coogan, *supra* note 6.

<sup>8</sup> See Casamento, *supra* note 5, at 61-62.

right which, depending on the regulatory market under which it is created, exhibits characteristics of both a commodity and a currency. The second aim is to put forward key arguments as to why this is an important consideration. It is important for the nature of carbon units to be carefully considered, and for global convergence to be managed by governments and intergovernmental bodies on policy grounds, and not left to the market. The third aim is to discuss, in light of the future role of carbon units in international trade and commerce, which legal form should be ascribed to a carbon unit. I will observe that there is a tendency for carbon units to be treated as commodities. I will argue that there are compelling policy arguments, from both an environmental and economic perspective, for global convergence of carbon markets to occur on the basis that a carbon unit is an asset akin to a currency.

## II. WHAT KIND OF ASSET IS CARBON?

The units of exchange in nascent carbon markets have been ascribed different names, and are subject to different rules, but each represents the right to emit an amount of GHGs equivalent in greenhouse effect to one ton of CO<sub>2</sub> (one ton “CO<sub>2</sub>e”). This is true of the basic units tradable under the Kyoto Protocol:

- Assigned Amount Units (“AAUs”) — units that are allocated to countries under the Kyoto Protocol’s trading mechanism;
- Certified Emissions Reductions (“CERs”) — units generated under the Clean Development Mechanism (“CDM”); and
- Emission Reduction Units (“ERUs”) — units generated under Joint Implementation (“JI”).<sup>9</sup>

Units traded under regional, domestic and sub-national trading programs, also represent the right to emit one ton CO<sub>2</sub>e. For example:

- EUAs — the basic unit of exchange in the EU ETS;<sup>10</sup> and

---

<sup>9</sup> AAUs are issued by Annex I countries pursuant to their assigned amounts under arts. 3.7 and 3.8. See Kyoto Protocol to the United Nations Framework Convention on Climate Change (“UNFCCC”), Dec. 10, 1997, 37 I.L.M. 22 [hereinafter Kyoto Protocol]. CERs and ERUs are generated by investing in emission reduction projects under the Marrakesh Accords, UNFCCC, Conference of the Parties, *Report of the Conferences of the Parties on its Seventh Session, Decision 16.CP.7, 17.CP.7* U.N. Doc. FCCC/CP/2001/13/Add.2 (Jan. 21, 2002).

<sup>10</sup> The EC Council Directive establishing the EU ETS refers simply to “allowances,” Council Directive 2003/87, art. 3(a), 2003 O.J. (L 275) 32, 34 (EC) [hereinafter Directive 87]. These units, however, are commonly referred to as “EUAs” in analytical literature (see, e.g., Karan Capoor & Philippe Ambrosi, STATE AND TRENDS OF THE CARBON MARKET 6 (2007)) and in the market (see, e.g., The Green Exchange, Listing of New NYMEX Carbon, Nitrogen Oxides (NO<sub>x</sub>) and Sulfur Dioxide (SO<sub>2</sub>) Based Emission Allowance Futures and Options Contracts, <http://www.greenfutures.com/notices/ntm138.php> (last visited Apr. 19, 2008)) (on file with the Harvard Environmental Law Review).

- Abatement certificates — the carbon unit traded in the New South Wales Greenhouse Gas Reduction Scheme (“NSW GGAS”).<sup>11</sup>

As new national and sub-national markets are established, new recognized trading units are brought into existence, but in general units are not recognized and cannot be sold or redeemed in foreign markets. A notable exception is the linkage between the EU ETS and the flexible mechanisms under the Protocol; pursuant to EU Directive, CERs and ERUs can be used to meet obligations under the EU ETS.<sup>12</sup> Despite the diverse range of units, and the fragmentation of the market at present, for the sake of simplicity I will refer to these different units as “carbon units.”

Apart from specifying that carbon units are not property rights,<sup>13</sup> regimes establishing trading systems are generally silent as to the legal character of carbon units. Establishing provisions typically define the tradable unit not in terms of *what* the unit is, but what it entitles the holder to *do*. As Wijnen puts it, “[t]his definition has four elements: (1) the right to emit; (2) a specified substance; (3) of a certain quantity; (4) over a defined period of time.”<sup>14</sup> This is borne out in the EU Emissions Trading Directive, which covers all four elements in its definition of an allowance, as well as its fungibility:

‘[A]llowance’ means an allowance to emit one tonne of carbon dioxide equivalent during a specified period, which shall be valid only for the purposes of meeting the requirements of this Directive and shall be transferable in accordance with the provisions of this Directive.<sup>15</sup>

---

<sup>11</sup> Electricity Supply Act, 1995 N.S.W. Acts No. 94 §97AB.

<sup>12</sup> See, e.g., EU Linking Directive (EC) 2004/101, art. 11a(3)(b), 2004 O.J. (L338) 18-19 [hereinafter EU Linking Directive].

<sup>13</sup> See, e.g., REGIONAL GREENHOUSE GAS INITIATIVE MODEL RULE § XX1.2(k) (2007) (“No provision of this regulation shall be construed to limit the authority of the REGULATORY AGENCY to terminate or limit such authorization to emit. This limited authorization does not constitute a property right.”). The Kyoto Protocol and Marrakesh Accords are silent on the matter, as is the EU Emissions Trading Directive. Consider the contrast with New Zealand’s Individual Transferable Quotas in Fisheries, which purport to create property rights. Tom Tietenberg, *Tradable Permits in Principle and Practice*, in MOVING TO MARKETS IN ENVIRONMENTAL REGULATION 63, 79 (Jody Freeman & Charles D. Kolstad eds., 2007). The question of whether an emissions right is a property or quasi-property right is an interesting one, and is particularly pertinent to the relationship between the unit-holder and the government. Legislative drafters who carefully preclude any property rights are likely attempting to prevent future claims against the government by permit-holders arising from government action which devalues that person’s carbon units, for example by changing the regulatory system. See Matthieu Wemaere & Charlotte Streck, *Legal Ownership and Nature of Kyoto Units and EU Allowances*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS, *supra* note 1, at 35. It is, however, an issue which is beyond the scope of this article, which focuses on how carbon units are exchanged in the marketplace rather than the relationship it creates between unit-holders and governments.

<sup>14</sup> Wijnen, *supra* note 1, at 403-04.

<sup>15</sup> Directive 87, *supra* note 10.

A previous draft of the Directive prepared by the European Commission in which an “allowance” was defined as an “administrative authorization” was rejected by the Legal Service of the Commission because it conflicted with the principal of subsidiarity, and the adopted version was drafted so as to avoid addressing the issue of the legal characteristics of an emissions unit.<sup>16</sup> The issue of legal characterization has also been avoided in other jurisdictions.<sup>17</sup>

The aim of this part of the article is to look at the inherent characteristics of carbon units, and whether under current practice they are more akin to a commodity or a currency, or some other instrument. The point is not to suggest that carbon units *are* any of these things, since emissions rights are a *sui generis* right which may exhibit features of one or more of these instruments depending on the regime in which they are recognized.<sup>18</sup> Rather the aim of this part is to seek to arrive at a descriptive characterization, before moving on to consider the most desirable characterization from a functional perspective.

#### A. Commodity?

In the absence of clear guidance from the regulator, it has fallen to traders — impatient to take up opportunities in nascent markets — to decide how to conceptualize carbon units. The industry practice appears generally, and particularly in the United States, to treat emissions rights as commodities. Emissions and emissions derivatives are being built into large banks’ commodities portfolios. Barclays Capital and Citibank, both already important players in the energy industry, and increasingly key players in the emissions markets, have taken up this trend.<sup>19</sup> The International Swaps and Derivatives Association, an industry association for coal, gas, energy and other commodity traders, has published a new Annex to its Master Agree-

---

<sup>16</sup> Wemaere & Streck, *supra* note 13, at 48.

<sup>17</sup> New South Wales’ Greenhouse Gas Abatement Scheme involves the trading of “abatement certificates.” “Abatement certificate” is defined in Electricity Supply Act, 1995 N.S.W. Acts No. 94 § 97AB; this definition does not include the legal nature of this unit; *see also* RGGI MODEL RULES §§ XX-1.2(d), (k)(2007) (defining “allocation” and “CO<sub>2</sub> allowance”). The final report prepared by the Market Advisory Committee to the California Air Resources Board provides guidance on a wide range of carbon trading regulatory design issues, but does not discuss the legal form of carbon. MARKET ADVISORY COMMITTEE TO THE CALIFORNIA AIR RESOURCES BOARD, RECOMMENDATIONS FOR DESIGNING A GREENHOUSE GAS CAP-AND-TRADE SYSTEM FOR CALIFORNIA 68 (2007), [hereinafter MARKET ADVISORY COMMITTEE].

<sup>18</sup> Wemaere & Streck, *supra* note 13, at 37.

<sup>19</sup> Javier Blas, *China Alliance for Barclays Capital*, FT.COM, Oct. 10, 2007, [http://us.ft.com/ftgateway/superpage.ft?news\\_id=fto101020070032147600](http://us.ft.com/ftgateway/superpage.ft?news_id=fto101020070032147600). (“Barclays Capital will announce on Wednesday a strategic commodities alliance with China Development Bank to provide Chinese companies with risk management in the energy base metals and emissions sectors.”); John Clapp, Power, Sector Specialist, Citi Market and Banking, Address to McDermott Will & Emery 10th Energy Conference (Oct. 10, 2007) (“Commodity trading: Certified Emission Reductions — Citi is currently assessing several projects in both China and India across a variety of technologies including small hydro, wind energy and biomass generation.”).

ment for trades in EUAs, evidence of the commodity mindset being compounded in the industry.<sup>20</sup>

The industry's tendency to treat emissions as a commodity has been reflected in legal and policy literature. In an article about carbon contracting, Wilder, Willis and Guli refer to carbon as "a new commodity."<sup>21</sup> Their position is firm: "[n]otwithstanding the statutory or contractual basis of [emission reductions], they are ultimately commodities . . . ."<sup>22</sup> The Garnaut Climate Change Review, the body advising the Australian Federal Government in relation to the design of its national emissions trading system, also refers to carbon as a commodity: "[t]he market for emissions permits would take on characteristics of mature commodity markets which had depth and high liquidity . . . ."<sup>23</sup> Yet there is nothing in law that requires carbon to be traded as a commodity — lawyers and policy advisers are picking up on the *reality* that the industry is developing this way.

Emissions units do seem to have some characteristics we are used to seeing in commodities like metals, petrochemicals, and bulk foods. Within a homogenous market, carbon units can be traded like generic goods. Like commodities, carbon units can be sold through spot trades for immediate delivery,<sup>24</sup> or through futures contracts, pursuant to which units are delivered at a set price at a future date.<sup>25</sup> Like commodity trades, carbon trades are generally made in very large volumes (for example, in thousands or tens of thousands of tons).<sup>26</sup> The prices of commodities are fluid across time, but at any given time the price for a particular commodity will be generally uniform across the marketplace.<sup>27</sup> The rise and fall of the market value of EUAs

<sup>20</sup> See International Swaps and Derivatives Association, ISDA Commodity Definitions, Exhibits, Annexes and Confirmations, <http://www.isda.org/publications/isdacommderivdefsup.html> (last visited Apr. 1, 2008) (on file with the Harvard Environmental Law Review).

<sup>21</sup> Martijn Wilder, Monique Willis & Mina Guli, *Carbon Contracts, Structuring Transactions: Practical Experiences*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS, *supra* note 1, at 295, 331.

<sup>22</sup> *Id.* at 311.

<sup>23</sup> GARNAUT CLIMATE CHANGE REVIEW, INTERIM REPORT TO THE COMMONWEALTH, STATE AND TERRITORY GOVERNMENTS OF AUSTRALIA 45 (2008), available at <http://www.garnautreview.org.au> (follow "Reports, Papers and Specialist Submissions" hyperlink).

<sup>24</sup> The spot market is currently patchy. The first spot trade of CERs reportedly took place in 2007. Chicago Climate Exchange, *First-Ever CER Spot Trade*, 11(4) CCX MARKET REPORT 2 (Nov. 2007), available at [http://www.chicagoclimatex.com/docs/publications/CCX\\_carbonmkt\\_V4\\_i11\\_nov2007.pdf](http://www.chicagoclimatex.com/docs/publications/CCX_carbonmkt_V4_i11_nov2007.pdf). Spot trades can be conducted over Climex. See Climex, CER Spot Trading Is Now Available on Climex, <http://newvalues.blutarsky.nl/downloads/CER%20spot%20trading%20-%20five%20steps.pdf> (last visited May 15, 2008).

<sup>25</sup> The carbon futures market is well established, with carbon futures contracts traded on several exchanges, including the Chicago Climate Exchange, the Green Exchange, and the European Climate Exchange.

<sup>26</sup> A typical carbon futures contract (or "lot") is for the delivery of 1,000 carbon units (equivalent to 1,000 metric tons of CO<sub>2</sub>e) for a specified price on a specified date. See, e.g., Green Exchange, EUA Futures Contract Details, <http://www.greenfutures.com/markets/?s=4&id=6> (last visited Apr. 19, 2008); European Climate Exchange, What Are Futures?, [http://www.europeanclimateexchange.com/default\\_flash.asp](http://www.europeanclimateexchange.com/default_flash.asp) (last visited Apr. 19, 2008).

<sup>27</sup> Global commodity prices slump and spike in "commodity price cycles." See generally Paul Cashin, C. John McDermott, & Alasdair Scott, *Booms and Slumps in World Commodity*

within the EU ETS<sup>28</sup> seems to indicate that carbon prices will behave in a similar fashion.

Carbon futures markets have also emerged, similar to those tied to traditional commodity markets. Participants in the EU ETS can purchase on the European Climate Exchange futures where the underlying instruments are EUAs and CERs.<sup>29</sup> While the Chicago Climate Exchange, the United States's only registry dealing in carbon units, does not deal in futures contracts,<sup>30</sup> the New York Mercantile Exchange ("NYMEX"), an active participant in the sulfur dioxide ("SO<sub>2</sub>") and nitrous oxide ("NO<sub>x</sub>") markets, trades in SO<sub>2</sub> and NO<sub>x</sub> futures,<sup>31</sup> and is due to commence trading in EUA and CER futures in 2008.<sup>32</sup>

### B. Currency?

Another way to consider carbon units is as currency-like units. Jürgen Lefevere writes that "[t]he Kyoto Protocol and the Marrakesh Accords provide for a cap, a trading 'currency', monitoring, reporting, and verification procedures . . . ."<sup>33</sup> Carbon markets do exhibit many hallmarks of currency markets, although this is not yet widely recognized.

One reason that carbon markets are like currency markets is that, unless recognized by a government, a currency is worthless. The same is true for a carbon unit. If the Euro were replaced with the "SuperEuro," the value of Euros would disappear. If the European Commission issued a directive announcing that EUAs were no longer accepted to meet compliance requirements in the EU, the value of an EUA would likewise disappear. Contrast this with a commodity like a barrel of oil, which does not require certification from any government to have value.

Carbon units show many similarities to currencies as they were before the convergence of various currencies into an international monetary system:

---

*Prices* (International Monetary Fund, Working Paper No. WP/99/115, 1997), available at <http://www.imf.org/external/pubs/ft/wp/1999/wp99115.pdf>.

<sup>28</sup> According to Regina Betz, "[f]our different influences on allowance prices have been identified by market observers: immaturity of the market; general price driving factors; supply factors; [and] demand factors." Regina Betz, *What Is Driving Price Volatility in the EU ETS?*, AUSTRALIAN EMISSIONS TRADING FORUM REVIEW 4, 4 (Oct./Nov. 2006), available at [http://aetf.emcc.net.au/pdf\\_reviews/ReviewOctNov2006.pdf](http://aetf.emcc.net.au/pdf_reviews/ReviewOctNov2006.pdf).

<sup>29</sup> See generally European Climate Exchange, <http://www.europeancclimateexchange.com> (last visited Apr. 1, 2008).

<sup>30</sup> The tradable unit on the Chicago Climate Exchange platform is a carbon financial instrument contract, equivalent to 100 ton CO<sub>2</sub>e. See generally Chicago Climate Exchange, CFI Contract Specifications, <http://www.chicagoclimatex.com/content.jsf?id=483> (last visited Apr. 14, 2008).

<sup>31</sup> NYMEX SO<sub>2</sub> Emissions Futures Product Description, [http://www.nymex.com/RS\\_spec.aspx](http://www.nymex.com/RS_spec.aspx) (last visited Apr. 1, 2008); NYMEX NO<sub>x</sub> Emissions Futures Product Description, [http://www.nymex.com/RN\\_spec.aspx](http://www.nymex.com/RN_spec.aspx) (last visited Apr. 1, 2008).

<sup>32</sup> Press Release, NYMEX to Launch First Contracts in Green Exchange Initiative, (Feb. 25, 2008), available at <http://www.greenfutures.com/news/news3.php>.

<sup>33</sup> Jürgen Lefevere, *Linking Emissions Trading Schemes: The EU ETS and the 'Linking Directive'*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS, *supra* note 1, at 511, 512.

they are government-sanctioned units of exchange which are not recognized or valued outside the government's jurisdiction. The convergence of monetary systems over the last millennium, which historically involved pegging of currencies to precious metals (silver in the 19th century, until it was replaced with the gold standard in 1870),<sup>34</sup> now involves a floating system whereby one currency is convertible into another currency at a variable rate.

The convergence of global carbon markets could follow a similar process to the convergence of money markets. Different units could be ascribed value relative to the carbon equivalent of a "gold standard"<sup>35</sup> and float freely in relation to each other, or could be valued in accordance with periodically reviewed and reported rates of exchange. Just as currency markets currently tolerate some price pegging, where suitable or necessary, one carbon currency could be pegged to another carbon currency.<sup>36</sup>

Another feature of carbon units which is reminiscent of monetary instruments is the ability to "bank" and "borrow" units. Under the EU ETS and RGGI rules, allowances and credits of a particular vintage can be banked and used for compliance at a later date. These tools enable market participants to manage market volatility and reduce compliance costs.<sup>37</sup> Nascent U.S. market systems are also likely to include banking mechanisms and may provide limited scope for borrowing.<sup>38</sup> An entity borrows carbon units when it uses units it anticipates that it will be allocated from a future compliance period to comply with its obligations in the present compliance period.<sup>39</sup> While the banking of credits could be likened to stockpiling of a good, there is no equivalent concept of borrowing in commodity markets.

The international accounting community has grappled with the characterization of emissions units, and has put forward various proposals for accounting treatment over recent years, including treatment as an intangible

---

<sup>34</sup> Michael Mondshine, Jette Findsen & Christina Davies, *The Currency of Carbon*, CARBON FINANCE, Jan. 14, 2005.

<sup>35</sup> The reference here can be taken to refer to Gold Standard carbon credits approved by the Gold Standard Foundation, a non-profit based in Switzerland. Indeed, this standard could be used as a global denominator against which other emissions units are measured, but another standard might be developed.

<sup>36</sup> To an extent, price pegging is already occurring in the CER market. China's informal CER pricing policy sets a minimum price floor of U.S. \$10.40-11.70 per ton. Capoor & Ambrosi, *supra* note 10, at 21. CER forward contracts are sometimes pegged to the price of EUAs. *Id.* at 32-33 ("Most of these [secondary CER trades] have contracts calling for fixed prices, although the contract may be pegged to a percentage of a specified forward EUA price, e.g. 78% of a Dec-'08 EUA.").

<sup>37</sup> A. Denny Ellerman, Paul L. Joskow & David Harrison, Jr., EMISSIONS TRADING IN THE U.S. — EXPERIENCE, LESSONS, AND CONSIDERATIONS FOR GREENHOUSE GASES 11, 27 (2003), available at [http://www.pewclimate.org/docUploads/emissions\\_trading.pdf](http://www.pewclimate.org/docUploads/emissions_trading.pdf).

<sup>38</sup> The Market Advisory Group to the California Air Resources Board recommends that banking, but not borrowing, be permitted. Market Advisory Committee, *supra* note 17, at 66. Senators McCain and Lieberman's proposed Climate Stewardship Act would allow firms to borrow a portion of their compliance units. Pew Center on Global Climate Change, Summary of the Lieberman-McCain Climate Stewardship Act, [www.pewclimate.org/policy\\_center/analyses/s\\_139\\_summary.cfm](http://www.pewclimate.org/policy_center/analyses/s_139_summary.cfm) (last visited April 5, 2008).

<sup>39</sup> MARKET ADVISORY COMMITTEE, *supra* note 17, at 66.



asset or a government grant.<sup>40</sup> Having considered these proposals, in December 2003, the International Financial Reporting Interpretations Committee (“IFRIC”), a committee of the International Accounting Standards Board (“IASB”), determined that an emissions unit is akin to, and should be accounted for in the same way as, monetary currency. IFRIC reasoned that an emission unit is similar to a currency because its value is derived only from its use to meet an obligation, and its value can be determined with reference to market prices.<sup>41</sup> The IASB agreed with this reasoning and accordingly issued a draft amendment to international accounting standards.<sup>42</sup>

The idea of a currency has not received a great amount of attention from policymakers, but UK environment secretary David Miliband has suggested that a personal carbon trading scheme could be implemented which would require UK citizens to pay for their energy-intensive activities by spending allocated carbon credits.<sup>43</sup> Of the imagined scheme, he said: “Imagine a country where carbon becomes a new currency. We carry bank cards that store both pounds and carbon points. When we buy electricity, gas and fuel, we use our carbon points as well as pounds.”<sup>44</sup>

### C. Other?

It has also been suggested that an emission right might be characterized as a security.<sup>45</sup> In Germany, allowances are not treated as securities for the purposes of the German Financial Credit Act, but derivatives based on allowances are.<sup>46</sup> While both carbon units and securities are financial instruments, they have little else in common, and I argue that this is not a useful characterization. In general carbon units are completely separable from the regulated entity, unlike securities, which essentially represent part ownership of an entity.

Some authors prefer to stay with stricter legal characterizations when referring to carbon units. Some refer to them only as “permits” and the market as a “permit” market.<sup>47</sup> A pollution permit can be thought of as a “regulatory right.”<sup>48</sup> These characterizations are accurate but do little to shape the design of trading mechanisms, and in any event would not hold any sway in an international commercial setting.

---

<sup>40</sup> Casamento, *supra* note 5, at 58-60.

<sup>41</sup> *Id.* at 65.

<sup>42</sup> *Id.*

<sup>43</sup> UK Minister Mulls Personal Carbon Trading, CARBON FINANCE, Jul. 31, 2006.

<sup>44</sup> *Id.*

<sup>45</sup> Interview with Professor Jody Freeman, Harvard Law School, in Cambridge, Mass. (Nov. 20, 2007). Professor Freeman recounted that in discussions with New York based finance lawyers, the term “security” was used to refer to emissions rights.

<sup>46</sup> Simon Marr, *Implementing the European Emissions Trading Directive in Germany*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS, *supra* note 1, at 431, 441.

<sup>47</sup> Bruce Yandle, *Grasping for the Heavens: 3-D Property Rights and the Global Commons*, 10 DUKE ENVTL. L. & POL'Y F. 13, 22 (1999).

<sup>48</sup> *Id.* at 38.

The remainder of this article will focus on the concept of carbon units as *sui generis* rights which exhibit features of commodities and should be traded like commodities, and as *sui generis* rights which exhibit features of currencies and should be traded like currencies.

### III. WHY CONSIDER THE COMMODITY/CURRENCY QUESTION?

One of the reasons the trading mechanism was adopted in the Kyoto Protocol was due to the success of the U.S. Acid Rain Program. This program demonstrated that allowing regulated installations to trade in emissions permits can enable cuts in emissions to be achieved up to fifty percent more cheaply than under a command-and-control approach.<sup>49</sup> The hope is that similar results can be achieved through carbon trading, and it has even been suggested that the marginal cost of reducing GHG emissions in Organisation for Economic Co-operation and Development regions would be reduced by eighty to ninety percent if global trading were implemented (although it is acknowledged that in practice the efficiency gains are likely to be more modest).<sup>50</sup>

While carbon trading builds on experience gained through domestic environmental markets, there has never been a cross-border environmental market before the emergence of the international carbon trading market. Therefore a “learning by doing” approach is being taken. In fact, since emissions trading has until now been a national, sub-national or limited regional affair, there has been little impetus to settle questions about the legal nature of an emissions allowance. U.S. emissions markets like the Acid Rain Program were comparatively simple, geographically-limited, top-down regimes, where participation was dominantly compliance-driven and the units of exchange were homogenous.<sup>51</sup> Domestic administrative and environmental law, and environmental regulators, are sufficient to administer these self-contained regimes. In contrast the international carbon market will be geographically-diverse, fragmented, horizontally-administered, speculation as well as compliance-driven, and will carry heterogeneous units of exchange. It is more than a domestic administrative regime: it is a global experiment — a new system of exchange worth billions of dollars. Ensuring

---

<sup>49</sup> Ellerman, Joskow & Harrison, *supra* note 37, at 16; Richard Rosenzweig, Matthew Varilek & Josef Janssen, THE EMERGING INTERNATIONAL GREENHOUSE GAS MARKET 1, 3 (2002), available at <http://www.pewclimate.org/docUploads/trading.pdf>.

<sup>50</sup> INTERNATIONAL ENERGY AGENCY, INTERNATIONAL EMISSION TRADING: FROM CONCEPT TO REALITY 36-37, 123 (2001).

<sup>51</sup> Section 403 of the Clean Air Act creates a market for just one kind of unit: SO<sub>2</sub> allowances 42 U.S.C. § 7651b (2000). In 2006, most arms-length purchasers of SO<sub>2</sub> units through the Acid Rain Program were power companies, and most trades were compliance-driven. EPA, ACID RAIN AND RELATED PROGRAMS: 2006 PROGRESS REPORT 12 (2006). Transfers through an EPA-administered online transfer system constituted 94 percent of total transfers. *Id.*

an ideal model is adopted is important to ensuring that expectations held on the basis of the SO<sub>2</sub> experience are met.

Theoretically the carbon market is created through a top-down mechanism, starting at the top with an international treaty and working its way down through national legislation binding on private firms. However in practice independent markets are emerging across the globe. Some of these markets have been initiated in Kyoto-affected jurisdictions, including the EU ETS, the UK ETS and the NZ ETS, and others are completely independent of the Protocol, such as the United States' RGGI and WCI, and Australia's GGAS. Many of these previously unrelated markets are now moving towards linking with each other. The convergence of the international carbon market is now a horizontal process, whereby established national and sub-national markets are interfaced with other markets. The ICAP process, through which national and provincial governments plan to discuss mutual recognition of trading units with the goal of linking markets in Kyoto affected countries and non-Kyoto impacted countries,<sup>52</sup> will need to address tensions between the stringency of the various trading programs. These systems are currently developing independently, leading to a range of design differences which may act as technical barriers to linking which ICAP now seeks to redress.<sup>53</sup> It is therefore timely to consider the nature of the asset upon which a global trading system will be built, and the model of global trading system that will be adopted. This discussion should focus on how these may serve to facilitate convergence rather than hinder it.

The underlying economic justification for emissions trading brings into relief the importance of optimal regulatory design. A poorly designed system will lead to inefficiency, potentially cancelling out any potential cost-reduction goals.<sup>54</sup> The impetus for an efficient and cost-effective global trading system is not merely economic — a system which “lower[s] the cost of achieving environmental objectives”<sup>55</sup> will allow greater environmental benefits by enabling deeper reductions in emissions.<sup>56</sup> It will likely also cause private enterprise in unregulated jurisdictions to place pressure on domestic governments to implement cap-and-trade systems, thereby lessening the potential for “leakage” (the movement of polluting activity from regulated jurisdictions to unregulated jurisdictions).

---

<sup>52</sup> See ICAP Website *supra* note 4.

<sup>53</sup> ICAP Declaration, <http://www.icap-carbonaction.com/declaration.htm> (last visited Apr. 18, 2008) (“ICAP will establish an expert forum to discuss relevant questions on the design, compatibility and potential linkage of regional carbon markets.”).

<sup>54</sup> See Ellerman, Joskow & Harrison, *supra* note 37, at Exec. Summ. iv.

<sup>55</sup> Rosenzweig, Varilek & Janssen, *supra* note 49, at 1.

<sup>56</sup> See Capoor & Ambrosi, *supra* note 10, at 35. “[Restricting US markets to domestic offsets] would be a missed opportunity to use the efficiency of the global market to ensure the maximum environmental benefit through ambitious emission reduction targets.”; Ellerman, Joskow & Harrison, *supra* note 37, at Exec. Summ. v; THOMAS. H. TIETENBERG, EMISSIONS TRADING: PRINCIPLES AND PRACTICE 62 (2006).

The tendency for governments to “leave it up to the market”<sup>57</sup> not only allows divergent practices to emerge across jurisdictions, but effectively places some system design power in the wrong hands. Rosales sums up the problem:

Even if entitlements to the new commodity are distributed to all parties’ satisfaction and the fabricated market accepted, in many tradable permit cases it is not clear exactly what is being bought and sold. Increasingly vague commodities are being created to fit the necessities of a market system. Disparate unique physical properties are put through a creative accounting iteration to remove their diverse properties that stand as obstacles to economic commercialization.<sup>58</sup>

If the private sector, taking the latitude given to it by governments, develops the carbon market as a *de facto* commodity market, which is likely given the identity and experience of the market players,<sup>59</sup> governments will face fierce opposition if they later elect to alter the carbon trading landscape. If designing environmental markets is left to market participants, incentives for conservation will make way for profiteering, and later attempts by regulators to check the balance in favor of conservation will likely be rebuffed. This has been seen with the fading out of carbon taxes from the policy landscape in the United States. If a carbon tax had been introduced ten years ago, before the private sector put its lobbying power behind carbon trading, it might not have become the politically unpalatable option it now is. The fact that there are nine cap-and-trade bills<sup>60</sup> and no carbon tax bills before the U.S. Congress at the time of writing is a warning tale of how potentially effective measures can experience political death when legislators vacillate.<sup>61</sup>

---

<sup>57</sup> See Wemaere & Streck, *supra* note 13, at 53.

<sup>58</sup> Jon Rosales, *Economic Growth and Biodiversity Loss in an Age of Tradable Permits*, 20 CONSERVATION BIOLOGY 1042, 1046 (2006) (citation omitted).

<sup>59</sup> Some of the likely investors include the commodity trading arms of large industrial firms, which are experienced in oil and other commodities. See, e.g., *Sumitomo to Trade Carbon*, CARBON FINANCE, Sept. 18, 2006.

<sup>60</sup> See America’s Climate Security Act of 2007, S. 2191 110th Cong.; Low Carbon Economy Act of 2007, S. 1766, 110th Cong.; Climate Stewardship and Innovation Act of 2007, S. 280, 110th Cong.; Global Warming Pollution Reduction Act, S. 309, 110th Cong. (2007); Electric Utility Cap and Trade Act of 2007, S. 317, 110th Cong.; Global Warming Reduction Act of 2007, S. 485, 110th Cong.; Containing and Managing Climate Change Costs Efficiently Act, S. 1874, 110th Cong. (2007); Climate Stewardship Act of 2007, H.R. 620, 110th Cong.; Safe Climate Act of 2007, H.R. 1590, 110th Cong.

<sup>61</sup> However, Senator Dingell, a Democrat and Chairman of the Energy and Commerce Committee, is reportedly working on a carbon tax bill which would impose a tax on coal, petroleum and natural gas, as well as gasoline, and would distribute the revenue amongst various social and environmental portfolios. John Dingell, Summary of Draft Carbon Tax Legislation, <http://www.house.gov/dingell/carbonTaxSummary.shtml> (last visited April 5, 2008) (on file with the Harvard Environmental Law Review). See also COMMITTEE ON ENERGY AND COMMERCE, CLIMATE CHANGE LEGISLATION DESIGN WHITE PAPER: SCOPE OF A CAP-AND-TRADE PROGRAM 3 (2007) (proposing to supplement a cap-and-trade program with tax measures).

In sum, in the forty or so years since the idea of using property or quasi-property rights to regulate pollution was first conceived,<sup>62</sup> energy and environmental markets have become increasingly sophisticated, and the role of speculators and specialized financiers in energy and emissions markets has also increased dramatically. The plans to link carbon markets into an international market means taking an old idea into uncharted territory in terms of scale and complexity. These previously unanticipated aspects of carbon trading will need to be addressed to ensure that it is still an efficient and cost-effective way of achieving verifiable environmental results. The fact that the global carbon market is likely to be a finance-driven market is likely to mean that the use of bureaucratic, legalistic language like “administrative approvals” or “quasi-property rights” to refer to units of trade will not be tolerated by the industry. Furthermore, since linking between Kyoto-affected and non-Kyoto countries now looks inevitable, unanticipated problems of equivalence between units of exchange requires urgent attention before global convergence occurs.

#### IV. ADVANTAGES OF THE CURRENCY MODEL

##### A. *Basic Features of a Currency Model*

The architecture of a currency-style carbon trading system could vary in many respects, but the basic features might include:

- different units of exchange with independent relative value, each one of which is sponsored by a government or intergovernmental body;
- a system of foreign exchange, using either fixed or floating rates;<sup>63</sup>
- freedom of each government (or a governmentally-approved body, such as an independent carbon bank, similar to a central bank<sup>64</sup>) to control the rate of exchange between the domestic

---

<sup>62</sup> See TIETENBERG, *supra* note 56, at 4 (discussing early theories about environmental markets).

<sup>63</sup> The question of which exchange rate system should be used is an important one, and beyond the scope of this article and the expertise of its author. Briefly, if a fixed rate system were used, carbon currencies could be valued against a “gold standard” carbon unit, or in International Monetary Fund language, a unit similar to the “Special Drawing Right.” If a floating exchange rate system were adopted, governments could float their carbon currencies against a dominant currency, such as an EUA. See generally HAL SCOTT, INTERNATIONAL FINANCE: TRANSACTIONS, POLICY AND REGULATION, at Chapter 8 (15th ed. forthcoming June 2008) (on file with author).

<sup>64</sup> The creation of an independent European carbon bank is argued by British Prime Minister Gordon Brown to promote “the longer-term transparency and predictability that the market needs.” Paul Taylor, *UK's Brown Calls for EU Carbon Bank*, REUTERS Feb. 21, 2008, <http://www.reuters.com/article/environmentNews/idUSBRU00633120080222> (on file with the Harvard Environmental Law Review).

carbon currency and a foreign carbon currency, depending on whether a fixed or floating exchange system is adopted;

- a mechanism by which governments provide transparency both on domestic cap-and-trade systems and exchange arrangements with other governments; and
- a multilateral institution (possibly a secretariat within the International Monetary Fund (“IMF”)) which oversees the international carbon market, and which might or might not take active measures to ensure the liquidity and stability of the market.

The following sections discuss how these features of a trading regime promote environmental integrity and cost-effectiveness.<sup>65</sup>

### *B. Pricing: Promoting Environmental Integrity, Preserving Efficiency*

From an environmental perspective, one of the greatest concerns about the marketization of GHG emissions is that less environmentally or financially additional units will enter the market, driving down the price of units across the market, and resulting in lower overall GHG mitigation. A credit is environmentally additional if it produces outcomes which would not have occurred under business as usual. Financially additional projects are projects which would not have been financially viable without the ability to sell emissions credits to overseas investors. Both financial and environmental additionality are questions of degree; i.e., a project may be *somewhat* environmentally or financially additional but not *as* environmentally or financially additional as another project.

One example of this problem is the phenomenon known as “hot air.” Hot air is created when one market has excess units, for example due to an industrial downturn and reduced production, which it then may sell into other markets where supply is still limited.<sup>66</sup> Former members of the Soviet Union are seen as the principal source of hot air units.<sup>67</sup> A second example of the additionality problem is found in relation to units which are generated through changes to land use and forestry practices, including CERs generated through land use, land use change and forestry (“LULUCF CERs”)<sup>68</sup> which are considered to lack permanence. A third example is allowances originating from a non-Kyoto jurisdiction. Such a unit might be created

---

<sup>65</sup> See MARKET ADVISORY COMMITTEE, *supra* note 17, at 18 (suggesting that environmental integrity, cost-effectiveness, fairness and simplicity are key features of a cap-and-trade system).

<sup>66</sup> See Luke Brander, *Kyoto Mechanisms and the Economics of Their Design*, in CLIMATE CHANGE AND THE KYOTO PROTOCOL 25, 32-34 (Michael Faure, Joyeeta Gupta & Andries Nentjes eds., 2003).

<sup>67</sup> Capoor & Ambrosi, *supra* note 10, at 40.

<sup>68</sup> LULUCF CERs are those generated through “land use, land use change and forestry” projects under the CDM or JI as authorized by rules adopted at COP9 in December 2003. UNFCCC, Conference of the Parties, (Mar 30, 2004) *Report of the Conferences of the Parties on its Ninth Session, Decision 19.CP9* U.N. Doc. FCCC/CP/2003/6/Add.2.

under a trading regime subject only to domestic laws and therefore potentially with baselines and targets less stringent than those set under the Kyoto process, or more lenient rules on the use of offsets.<sup>69</sup>

The key underlying concern in the case of hot air, LULUCF and other units of questionable environmental or financial additionality, when it comes to trading, is essentially the equivalence of units generated under different rules in different trading systems.

Several strategies have been suggested and/or employed to address the equivalence problem and to try to maintain the environmental integrity of the units traded on the open market when trading systems are linked. The first is to block certain credits from entering the market altogether, without necessarily precluding the establishment of a separate market for credits of that ilk. To overcome the lack of market for avoided deforestation credits, the Center for Clean Air Policy has suggested that a separate market be set up for these credits for the post-2012 period.<sup>70</sup> The second is to allow the credits onto the international market and leave it to governments in participating jurisdictions to exclude non-equivalent units from recognition in their jurisdiction. For example, even through the Executive Board of the CDM approves LULUCF CERs, these credits are excluded from the EU market.<sup>71</sup> A third approach might be to make a new class of non-transferable credits, which are environmentally additional, but not equivalent to other credits on the market. Non-transferable credits are not common in carbon markets around the world, but are being used in the NSW GGAS system.<sup>72</sup> A fourth strategy is to negotiate up the standards of non-equivalent units so that there is reasonable equivalence between all traded units. This might be possible in the case of negotiating with a third party government which adopts a less stringent cap for its domestic cap-and-trade system, but will in many cases not be a feasible option.

All four of the strategies respond to concerns about the equivalence of the prevailing metric of exchange, one ton of CO<sub>2</sub>e. Quite clearly, even though it is a convenient unit, despite its name (which relates to the equivalence of emissions reductions between CO<sub>2</sub> and other GHG gases), this unit of measurement is not “equivalent” across the board. However, the strategies adopted to address the actual non-equivalence of CO<sub>2</sub> units restrain trade altogether. This binary approach (“either you’re in or you’re out”)

---

<sup>69</sup> The EU ETS has been criticized for allowing too many Chinese project-based credits onto the EU market. Stephanie Baker-Said, *Carbon Traders Create Cheap Credits in China for Sale in Europe*, BLOOMBERG.COM, Nov. 5, 2007, [http://www.bloomberg.com/apps/news?pid=20601170&refer=special\\_report&sid=ayq1nbYcdsco](http://www.bloomberg.com/apps/news?pid=20601170&refer=special_report&sid=ayq1nbYcdsco) (on file with the Harvard Environmental Law Review).

<sup>70</sup> *Save Rainforests Under a Separate Carbon Market, Argues CCAP*, CARBON FINANCE, Sept. 14, 2007, available at <http://www.carbon-financeonline.com/index.cfm?section=global&action=view&id=10752> [hereinafter *Save Rainforests Under a Separate Carbon Market*].

<sup>71</sup> EU Linking Directive, *supra* note 12, at 18.

<sup>72</sup> The New South Wales Greenhouse Gas Abatement Scheme includes “transferable NSW Greenhouse Abatement Certificates” and “non-transferable Large User Abatement Certificates.” GGAS Fact Sheet: Abatement Certificates 1 (2004), <http://www.greenhousegas.nsw.gov.au/documents/syn85.asp>.

safeguards equivalence, but at the cost of reducing incentives to invest in climate mitigation strategies which do not conform with the prevailing standards. One could refer to this as the “equivalence impasse.” To protect environmental certainty, a sacrifice is made because diverse and potentially valid and geographically appropriate strategies are left unexplored and unexploited. Turning again to the LULUCF example, this can prevent potentially very valuable flows of capital into developing countries with large forests. The result is that the economic incentives to grow “cows and coffee” are not displaced by competing incentives to preserve native forests as carbon sinks.<sup>73</sup>

The reason for binary rules is the underlying assumption that, as a commodity-like asset, carbon can only be measured in a metric unit. Non-equivalent carbon units would be treated as different commodities, which cannot be part of the same market. To make an analogy, the global price for soybeans at the time of writing is \$1,389.25 per bushel and the price of corn is \$604.75 per bushel.<sup>74</sup> These prices presumably reflect the availability of corn and soybeans respectively, and the value that buyers place on the inherent characteristics of these two products. If a commodity seller offered to sell a bushel of corn for \$1,389.25 presumably they would not find a buyer at that price, because although corn and soybeans are both vegetables and both measured in bushels, they are not equivalent products. Corn and soybean markets are therefore separate despite their similarities. Likewise, suppose that Carbon Unit<sub>x</sub>, which is the unit of exchange in Country X’s strict cap-and-trade market where units are scarce, trades at \$50. Carbon Unit<sub>y</sub>, which is a product of Country Y’s lax cap-and-trade system in which units are more abundant, is traded at \$25. Under a commodity model, even though both carbon units represent the right to emit a *ton* of CO<sub>2</sub>, they would be traded as different commodities, because they are not equivalent. Assuming that both regulatory systems are not changed, the two markets could not be linked.

In other words, Country X will tell Country Y, “you’re out.” Both the “you’re in” result and the “you’re out” result can have negative consequences for global climate action. If “hot air” is traded freely on the market, or if a non-Kyoto trading regime with weak targets is allowed to trade 1:1 on the market, an artificial comparative advantage is created and the overall costs of carbon will drop, benefiting buyers, but making more expensive emissions reduction projects (both to meet targets by emitters or through investment in the CDM) economically unfeasible. This would undermine the environmental integrity of the entire system. The “you’re out” answer will stall investments in some viable environmentally additional

---

<sup>73</sup> *Save Rainforests Under a Separate Carbon Market*, *supra* note 70 (citing Kevin Conrad, Ambassador of Environment and Climate Change for Papua New Guinea and Executive Director of the 30-Member Coalition for Rainforest Nations, cited in *Save Rainforests Under a Separate Carbon Market*, *supra* note 70).

<sup>74</sup> CNN Commodity Prices, <http://money.cnn.com/data/commodities> (last visited Apr. 15, 2008).



projects like LULUCF projects, an important and cost-effective method of reducing greenhouse gases.<sup>75</sup>

Ironically, we find that the commodity mindset, which adheres to the use of weight as a standard, can act to *restrain* the commodification of carbon rather than facilitate it. The inhibiting effect of standardization on market fluidity has been identified by Alan Sykes in relation to the product standards in international trade. Familiar weights, measures, and other technical requirements, originally created with the intention of *facilitating* trade, have turned out to be significant *barriers* to trade because the reality is that measures in fact *diverge* across national barriers: “[t]echnical barriers’ thus arise both from the divergence of standards and regulations across nations, and from the burden of establishing conformity with them whether or not they are divergent.”<sup>76</sup> Based on empirical evidence in other markets, we can see that strict adherence to equivalence and standardization in the converged carbon market will mean that developing countries are unable to monetize rainforests as carbon sinks, and will instead turn to agricultural commodities with established markets.<sup>77</sup>

If the commodity model is retained, the only way to defeat the equivalence problem is to treat different groups of carbon units as different classes of commodities, with different relative values. This is already happening to an extent, with different units entering different markets, and may be continued if these markets are linked under a standard commodity paradigm. Under this model, EUAs and CERs fall into one class of commodities which are tradable and interchangeable on the EU ETS, and a NSW allowance is another commodity, which is tradable only in the GGAS scheme. This is undesirable from a number of perspectives, foremost of which is that it would fail to achieve the primary objective of linking and converging carbon trading systems and the creation of a large, liquid market.

Adopting a currency approach would enable rule-makers to break the equivalence impasse, while ensuring a liquid market for units. Under a currency-like model, non-equivalent units would be traded much as non-equivalent currencies like the Euro and the U.S. dollar are traded in an international currency market (the exact nature of trades naturally depending on the exchange rate system adopted). Assuming that a fixed rate system is adopted, government-appointed regulatory agencies or central carbon banks could effect changes to “exchange” rates through regulations, for example by amending domestic laws to lower the relative value of certain exogenous

---

<sup>75</sup> Forests Now Declaration, <http://www.forestsnow.org>. (last visited Apr. 18, 2008) (“Deforestation in the tropics and sub-tropics contributes between eighteen and twenty-five percent of global carbon emissions, second only to the use of fossil fuels. Policy debates have been dominated by clean energy solutions, yet forests indisputably offer one of the largest opportunities for cost effective and immediate action and must now be treated with equal urgency. . . . Yet tropical forests continue to be excluded from carbon markets . . .”).

<sup>76</sup> ALAN SYKES, PRODUCT STANDARDS FOR INTERNATIONALLY INTEGRATED GOODS MARKETS 1-9 (1995), excerpted in John H. Jackson, William J. Davey & Alan O. Sykes, Jr., LEGAL PROBLEMS OF INTERNATIONAL ECONOMIC RELATIONS 576, 576 (4th ed. 2002).

<sup>77</sup> *Save Rainforests Under a Separate Carbon Market*, *supra* note 70.

carbon units. If one government has concerns about the financial and/or environmental additionality of the units from another market, this could be reflected in a lower rate of exchange with that unit. Another way of looking at this is as moving the point of negotiation from the stringency of targets to the rate of exchange.<sup>78</sup>

It should be noted that there will be some markets which should become fully integrated, and that a currency system would not prevent this. Just as the currencies of most members of the European Union have formed a monetary union, governments could elect to converge their carbon currencies into a “carbon union” with other governments. Such a pact would likely be made between governments enjoying mutual confidence in the equivalence of the two regulatory systems and each other’s “fiscal” discipline.

Under this model, otherwise “unproductive incompatibilities” amongst carbon units would be avoided by recognizing these incompatibilities.<sup>79</sup> The fiction that all carbon units should be or could ever be equivalent is removed, and the environmental value of a unit is expressed in terms of its exchange value. Interest groups would be less motivated to pressure governments to exclude weaker units from the market, because they would not drive down the overall standard of the market. This model would also help to stabilize carbon prices, since the shockwaves caused by a sudden over or under-supply in one region can be buffered through exchange rate adjustments in other regions. Stable prices and therefore more predictable returns would open the market to risk-averse investors — a benefit unavailable under a completely unified commodity-style system.<sup>80</sup> The overall result of a currency-style system would be a large, diverse, fluid and liberal market that creates economic incentives for a wide range of GHG mitigation actions.

### C. Creating a “Race to the Top”

Although buyers on the international carbon market will include regulated entities, speculators, and companies hoping to improve their corporate image, market demand will be driven by compliance-oriented entities and serviced by profit-oriented intermediaries.<sup>81</sup> As rational actors, these entities will be looking to meet their regulatory obligations at the least cost possible (this is, after all, the primary rationale for carbon trading). Of the tendency

---

<sup>78</sup> INTERNATIONAL ENERGY AGENCY, *ACT LOCALLY, TRADE GLOBALLY: EMISSIONS TRADING FOR CLIMATE POLICY* 125 n.109 (2005).

<sup>79</sup> SYKES, *supra* note 76, at 577.

<sup>80</sup> This is evidenced by the volatility of the EUA price. *See, e.g.*, Carbon Positive, EU Carbon Market on Volatile Run, (2008), <http://www.carbonpositive.net/viewarticle.aspx?articleID=1020>.

<sup>81</sup> The U.S. voluntary market was worth \$91 million in 2006. Lisa Kassenaar, *Carbon Capitalists Grab Gas From Pig Waste in Evangelical Quest*, BLOOMBERG.COM, NOV. 7, 2007, [http://www.bloomberg.com/apps/news?pid=20601170&refer=special\\_report&sid=asbxv0im4WxM](http://www.bloomberg.com/apps/news?pid=20601170&refer=special_report&sid=asbxv0im4WxM) (on file with the Harvard Environmental Law Review).

for carbon finance to flow to low-cost hydrofluorocarbon-23 (“HFC-23”) checking projects,<sup>82</sup> James Cameron, the Vice President of London-based Climate Change Capital says: “Right now the market is doing exactly what it should do — it’s going after as many tons as possible at the lowest possible cost and taking them out.”<sup>83</sup>

It is interesting to note that in the voluntary market, the opposite trend is occurring. Buyers are pushing for stricter standards for the credits they purchase. The market for Gold Standard carbon credits (premium carbon credits created by CDM, JI and Voluntary Emissions Reduction projects which meet certain benchmarks that aim to promote renewable energy, energy efficiency, local sustainable development and “rigorous additionality”<sup>84</sup>) has not attracted nearly as much attention from the compliance market as the voluntary market. The private and non-profit sectors are also driving for higher standards through the Voluntary Carbon Standard (“VCS”).<sup>85</sup> According to Jasmine Hyman, the marketing director at the Gold Standard Foundation in Switzerland, an explosion in the interest in premium credits has been driven by investment banks and businesses in the voluntary market looking to secure the public relations benefits of high quality credits.<sup>86</sup> Interestingly, there have not been equivalent consumer-driven initiatives to push for higher standards in the mandatory GHG market.

If the international market adopts a commodity approach, in which a ton from one market is worth a ton from another market, why would a compliance-driven entity look to Gold Standard credits when cheaper, lower quality credits can be used to fulfill their obligations? Why would profit-driven intermediaries invest in Gold Standard projects when investing in HFC-23 checking projects in China (which are of questionable additionality) delivers massive returns on capital investments? If a floating currency-style system were adopted, the environmental integrity of Gold Standard credits would be recognized in their relative value to lower quality credits and would not be fixed at a one-to-one ratio. HFC-23 projects would still generate credits with value, but the lower environmental and financial additionality of the projects could be reflected in the rate at which they are recognized and redeemable in various countries.

In a homogenous commodity model, market forces would pose the risk of causing a race to the bottom, because regulators would be lobbied by

---

<sup>82</sup> These projects typically involve the capture and thermal destruction of HFC-23 (a powerful GHG) which would otherwise be emitted as a waste byproduct from the production of the refrigerant HCFC-22. HFC-23 is an extremely potent GHG, which is easily removed by installing scrubbers, meaning that foreign investors can generate large numbers of credits with low levels of investment, making it the “low-hanging fruit” of the CDM. Richard Van Noorden, *Cleaning Up on the Carbon Market*, CHEMISTRY WORLD, Apr. 2007.

<sup>83</sup> Stephanie Baker-Said, *Cashing in on Pollution*, BLOOMBERG MARKETS MAGAZINE, Dec. 2007.

<sup>84</sup> Jasmine Hyman, *The Gold Standard — An Identity Shift*, CARBON FINANCE, Jun. 19, 2007.

<sup>85</sup> See Press Release, Climate Group, VCS Launch — A New Quality Assurance for the World’s Carbon Market (Nov. 19, 2007) (on file with author).

<sup>86</sup> Hyman, *supra* note 84.

companies to make it easier to create excess credits. The market-distorting capacity of 1:1 recognition of credits is demonstrated by the market being flushed with cheap CDM credits generated through HFC-23 projects in China, which now constitute almost half of the CDM credits generated to date.<sup>87</sup>

A currency model would create market balance, and if anything a race to the top. Lax standards in the administration and oversight of a cap-and-trade system would cause a carbon currency to be devalued, and domestic sellers would be more inclined to lobby for higher domestic standards to ensure that the proper value of their "product" is recognized in rates of exchange. It might even unlock the power of the private sector to push for high environmental standards similar to VCS and the Gold Standard in mandatory as well as voluntary markets. Even if this is not fully appreciated, the ability to point to international imperatives (the preservation of a strong rate of exchange) would provide an important way of counteracting domestic pressure to lower environmental standards. This is extremely important when considering that it now looks likely that some countries will enter the international carbon market even though they have not ratified the Kyoto Protocol. These countries will therefore only be bound by unilaterally determined domestic standards and not by international standards.

The issue can also be described in the language of comparative advantage. In a commodity setting, a seller subject to the jurisdiction of a country with the most lax environmental standards enjoys an artificial comparative advantage relative to another seller subject to stricter standards in another jurisdiction. It will be able to produce credits cheaply, or will receive excess credits at a low cost or free of cost, and will be able to sell those credits across the border to entities in regulatory markets where stringent standards push up the price of a one ton unit of carbon.

Under a currency model, entities located within the jurisdiction of a country with a stringent and well-monitored cap and trade system will not suffer from an artificial comparative disadvantage, because the credits generated are worth more on the international market relative to those under the jurisdiction of lax governments. Some countries may enjoy a comparative advantage in relation to other sellers, but this advantage will be a fair, natural comparative advantage. Reducing emissions in those countries is cheaper. Exchange policies will reflect a tolerance for natural advantage and an intolerance for artificial advantage.

#### *D. Partnering with the Most Appropriate Bretton Woods Institution*

Another consequence of the legal characterization of emission units is the domestic and international institutions to whom administration and oversight falls. In the German example, emissions derivatives will be monitored by the Federal Agency for Financial Services (*Bundesamt für Finanz-*

---

<sup>87</sup> Baker-Said, *supra* note 69.

*dienstleistungen*) whereas spot trades of emissions units for compliance purposes will not.<sup>88</sup> In the United States, it is not yet clear, if any, which regulator will monitor trading in emissions. The Acid Rain Program, which describes the nature of SO<sub>2</sub> allowances as a “limited authorization to emit sulfur dioxide” which “does not constitute a property right,”<sup>89</sup> has not required a market overseer other than the U.S. Environmental Protection Agency. If large scale emissions trading commences, with complex derivatives strategies and diverse market players, it is likely to create political incentive for financial regulation. For example, in the United States, if carbon is traded as a commodity, the Commodity Futures Trading Commission would be the appropriate regulator. If carbon units were classified as a security, the Securities and Exchange Commission would have jurisdiction over trading. If carbon units were classified as a currency, it would be appropriate for responsibility to be given to the Federal Reserve, or a new institution with analogous powers and responsibilities.<sup>90</sup> At an international level, it will affect which international institution would be best suited to oversee the economic aspects of trading. If a commodity model is adopted, the World Trade Organization (“WTO”) would be the obvious overseer; if a currency model is adopted, the involvement of the IMF would make sense. This is discussed further below.

The nature of allowances and credits will also logically impact the platforms upon which derivatives are traded. Given that the global carbon market, already worth around € 30 billion, is predicted to be worth over € 100 billion (or U.S. \$144 billion) by 2020,<sup>91</sup> and the frenzy of eco-finance deals,<sup>92</sup> it is hardly surprising that many major exchanges around the world have been reported as “eyeing” the carbon market. To put this figure in perspective, it represents approximately one-fifth of the current total value of global trade in fuels.<sup>93</sup> Commodity and stock exchanges across the developing and developed world have made no secret of their interest in listing carbon-related products for sale on their exchanges.<sup>94</sup> In the United States, clarity about the kind of asset carbon units are would indicate whether the

---

<sup>88</sup> Marr, *supra* note 46, at 441.

<sup>89</sup> 42 U.S.C. § 7651b(f) (2000).

<sup>90</sup> See Taylor, *supra* note 64.

<sup>91</sup> Global Carbon Market Will Reach € 100bn by 2020 — Celent, CARBON FINANCE, Oct. 30, 2007, available at <http://www.carbon-financeonline.com/index.cfm?section=global&action=view&id=10841>.

<sup>92</sup> First Reserve, the world’s biggest energy-focused private equity firm, has made \$1 billion available to Blue Source for carbon credit-producing projects. Kassenaar, *supra* note 81. Credit Suisse and Morgan Stanley are also moving hundreds of millions of dollars into carbon finance. Baker-Said, *supra* note 83.

<sup>93</sup> Mondshine, Findsen & Davies, *supra* note 34, (citing WORLD TRADE ORGANIZATION, INTERNATIONAL TRADE STATISTICS 113 (2004)).

<sup>94</sup> In North America, both the New York Stock Exchange, the Toronto Stock Exchange, and the NYMEX are reportedly eyeing the carbon market. *Nymex Plans Carbon Futures*, CARBON FINANCE, May 17, 2007; *Toronto Stock Exchange Eyes Carbon*, CARBON FINANCE, Aug 5, 2005; see also Danny Fortson, *Euronext to Launch Carbon Trading Market*, BUS. WK., Oct. 23, 2007. The Hong Kong Exchange & Clearing, the Bolsa de Mercadorias & Futuros in Brazil, the National Commodity & Derivatives Exchange in India and the Dalian Commodity

NYMEX (which trades in commodities) or the New York Stock Exchange (which trades in stocks and currencies) would be the more appropriate platform.

The institutional issues are various, but the key issue from the perspective of this article is which of the existing Bretton Woods institutions might be best suited to play a role in the international carbon market. Many articles have been written on the question of whether international carbon trading can “survive” the WTO. Most provide strong arguments that a carbon credit is not covered by existing WTO Agreements, including the General Agreement on Tariffs and Trade (“GATT”),<sup>95</sup> because carbon units do not fall within the current meaning of a “product” under the GATT, and WTO jurisprudence has confirmed that GATT applies to tangible things with intrinsic value.<sup>96</sup> However, the WTO is continually widening its reach by negotiating further agreements,<sup>97</sup> and it is not impossible that in the future the WTO might negotiate directly a proposal to regulate trade in carbon units, especially if they are traded as commodities. This would make domestic carbon trading policy open to attack as a breach of national treatment, most-favored nation, or other WTO obligations.<sup>98</sup> Charnovitz has also suggested that concerns about violating WTO rules have had a “chilling effect” on climate treaty negotiations.<sup>99</sup>

The uncertainty about whether carbon trading comes within the scope of the WTO agreements springs partially from the assumption that carbon units are a kind of commodity. It also is attributable to the fact that the issue has not been raised in a WTO dispute. Without cross-jurisdictional recognition of carbon units (with the exception of CERs generated under the CDM, which are recognized in the major carbon trading zones such as the EU and Japan<sup>100</sup>) there is in effect no international carbon trading occurring. Therefore, no disputes have yet been brought before the WTO disputes panel to make a definitive ruling on the issue. But more importantly, it is a result of what Charnovitz refers to as the WTO’s “aloofness” in relation to international climate mitigation efforts.<sup>101</sup> Charnovitz has observed that, beyond arranging for granting the UN Framework Convention on Climate Change (“UNFCCC”) Secretariat observer status to the WTO Committee on Trade

---

Exchange in China are also reported to be expressing interest in carbon-related products. *Hong Kong Exchange Considers Carbon Trading*, CARBON FINANCE, Dec 11, 2006.

<sup>95</sup> See, e.g., Steve Charnovitz, *Trade and Climate: Potential Conflicts and Synergies*, in PEW CENTER ON GLOBAL CLIMATE CHANGE, BEYOND KYOTO: ADVANCING THE INTERNATIONAL EFFORT AGAINST CLIMATE CHANGE 141, 144 (2003).

<sup>96</sup> Wemaere & Streck, *supra* note 13, at 46-47.

<sup>97</sup> The WTO has the power to negotiate amendments under the Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations. Final Act, Apr. 15, 1994, 33 I.L.M. 1125, Art. X (1994).

<sup>98</sup> See General Agreement in Tariffs and Trade, Oct. 30, 1947, 61 Stat. A3, 55 U.N.T.S. 187, arts. I (General Most Favored Nation Obligation) and III (National Treatment on International Taxation and Regulation).

<sup>99</sup> Charnovitz, *supra* note 95, at 142.

<sup>100</sup> See CERs: *The Carbon Currency of Choice*, CARBON FINANCE, Apr 26, 2004.

<sup>101</sup> Charnovitz, *supra* note 95, at 162.

and Environment, the institution has not drawn the connection between trade and climate change.<sup>102</sup> Since Charnovitz wrote this, the WTO has initiated efforts to open up the market for clean technology such as catalytic converters and solar panels,<sup>103</sup> but it does not appear that any other efforts have been made.

In contrast, the World Bank and IMF, the two other institutions of the former Bretton Woods family, have been extremely engaged with climate change. The World Bank has successfully spearheaded the establishment of global carbon finance through its Prototype Carbon Fund (which pools capital provided by private and public investors and uses the funds to “convert” conventional energy projects in developing countries into greener energy production units<sup>104</sup>) and is an active contributor to international debates on climate change, particularly as it relates to development.<sup>105</sup> The IMF is also engaged with climate change, although thus far in a less hands-on way. It has studied the economics of climate change and has consistently championed the economic importance of early action on climate. The involvement of the IMF is likely to increase: at the Bali round of climate negotiations in December 2007 it announced its willingness to “play its part” in climate change issues, working together with the World Bank and UN agencies. The suggested contributions would relate to designing, analyzing and monitoring fiscal policies designed to mitigate climate change.<sup>106</sup>

An obvious observation must be made: the two money-oriented institutions — the IMF and the World Bank — are closely involved in climate and carbon finance, whereas the traditionally goods-orientated institution — the WTO — is, to put it simply, not on the scene. There are various possible explanations for the unequal involvement of the three members of the Bretton Woods family. One might be that the core purpose of the WTO is to act as a forum where members agree on negative obligations (i.e. the reduction of tariffs and the removal of non-tariff barriers to trade) in respect to existing activities, whereas the IMF and World Bank, as monitoring and lending institutions respectively, logically are more able to identify issues and take actions in a proactive way in relation to matters that affect the global economy, of which climate change is one. Whatever the actual reason for this situation, the *status quo* is that the money-oriented institutions are extremely engaged in climate change, and might be assumed to be willing participants and/or partners to an international carbon trading regime.

---

<sup>102</sup> *Id.*

<sup>103</sup> See Pascal Lamy, Director General, WTO, Address at Yale University: The WTO and its Agenda for Sustainable Development (Oct. 24, 2007).

<sup>104</sup> See David Freestone, *The UN Framework Convention on Climate Change, the Kyoto Protocol, and the Kyoto Mechanisms*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS, *supra* note 1, at 3, 18-21.

<sup>105</sup> See World Bank, Climate Change, <http://web.worldbank.org/html/extar/thematic.htm> (follow “Environment” link then “Climate Change” link).

<sup>106</sup> IMF, The IMF and Civil Society: Reducing the Impact of Climate Change (2007), <http://www.imf.org/external/np/extr/cs/news/2007/121407.htm>.

My proposal is the collaborative involvement of the IMF in the convergence of global trading regimes, in the oversight of exchange and banking of carbon units in the international market, and in lending to stabilize markets. Although it has recently become more development-focused, some of the key aims of the IMF according to its Articles of Agreement are the promotion of international trade, the elimination of foreign exchange restrictions and the prevention of competitive currency depreciation.<sup>107</sup> In other words, the IMF's purpose is to ensure the successful convergence of world currencies into an orderly and stable system.<sup>108</sup>

The Articles of Agreement also require members to report intended exchange arrangements, either by way of pegged currency rate relative to Special Drawing Rights, cooperative arrangements between the members, or a general arrangement between members for a "widespread system of exchange arrangements based on stable but adjustable par values."<sup>109</sup> As such, IMF has been central to establishing liquid international money markets with transparent exchange arrangements. IMF also acts to stabilize the international monetary system by banking units of currency on behalf of members. Each IMF member is required to pay a subscription to the IMF in terms of Special Drawing Rights or "SDRs",<sup>110</sup> and the bank will advise a country if a scarcity of its currency becomes apparent.<sup>111</sup> The IMF also has experience with fixed and floating rates of exchange, having administered both systems respectively before and after the collapse of the Bretton Woods system in 1973.<sup>112</sup>

The experience and institutional set-up of the IMF make it an ideal facilitator in the convergence of foreign emissions trading into a global system. Since "learning by doing" has its perils, "doing by what has been learned" could save many tough lessons. The extent of IMF involvement would be a matter for further discussion. It could be quite limited: the IMF could provide advice to the UNFCCC or another multilateral organization on administering international carbon trading, and its Articles of Agreement could provide a useful template for future international carbon trading based on a monetary-style system. Alternatively, the IMF could be extensively involved, not only in the establishment of international carbon trading but also in the surveillance of a stable and liquid market for floating emissions units. For example, it could require members to routinely submit exchange arrangements to the IMF, thereby promoting transparency in the international market. It could also require members to pay some or all of their yearly IMF subscription in emissions units, thereby creating a fund of car-

---

<sup>107</sup> IMF, Articles of Agreement, July 22, 1944, Art I(ii)-(iv).

<sup>108</sup> See also *id.* art. IV.1, which sets out the undertakings of each member government to assist the IMF to "assure orderly exchange arrangements and to promote a stable system of exchange rates."

<sup>109</sup> *Id.* arts. IV.2, IV.3, IV.4.

<sup>110</sup> *Id.* art. III.1.

<sup>111</sup> *Id.* art VII.2.

<sup>112</sup> See Gold in the IMF, [www.imf.org/external/np/exr/facts/gold.htm](http://www.imf.org/external/np/exr/facts/gold.htm) (last visited Apr. 5, 2008).



bon units from which emergency supplies could be drawn in appropriate circumstances. Just as it currently lends currency units to countries to help remedy balance of payment problems, the IMF could lend carbon units back to a country facing a temporary shortage of units, thus helping to stabilize the international carbon market. Subscriptions are currently accepted in gold, money or securities,<sup>113</sup> all of which have dynamic value; it would not be an unimaginable leap to extend this to the currency of emissions.

As far as I am aware, this is a novel suggestion, but it would not be unprecedented for a United Nations and Bretton Woods partnership to be developed. The Restructured Global Environmental Facility is a "collaborative mechanism" between the UNFCCC and the World Bank, which was created in response to the environmental agenda set by the United Nations in Agenda 21.<sup>114</sup> Furthermore, as mentioned above, the IMF has indicated its willingness to work with UN agencies in the climate sphere.

The IMF need not necessarily be involved in driving the substance of agreements between countries as to the mutual recognition of units. It could play more of a facilitative role in supervising the multilateral arrangements arrived at between countries as a result of negotiations which take place primarily in the UN or other setting (such as ICAP). The key point is that the involvement of the IMF could optimize the operation of an international carbon monetary system, the shape of which would be the result of multilateral negotiation.

The manifest benefits of involving the IMF in the international carbon market and the manifest problems with involving the WTO support the argument in favor of a currency-style unit of exchange. There should be a rational relationship between the tradable unit and the international institution that governs it, and the ends sought should be reflected in the institutional arrangements that are adopted. Just as it would be logical to say that a carbon unit is a currency-like unit of exchange, and engage the IMF to assist with the development of international emissions markets, it would be illogical to claim that emissions rights are tradable commodities, and insist that the WTO has no jurisdiction in relation to them.

## V. CONCLUSION

It is not yet clear whether the international carbon market will slipstream behind the international commodities or currency markets. In this article, I have suggested even though that the prevailing tendency is to treat carbon as a commodity, a carbon unit is a *sui generis* right which can be traded like a currency. I have presented arguments in support of a carbon

---

<sup>113</sup> IMF, Articles of Agreement, arts. III.4, V.12(d).

<sup>114</sup> INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT, INSTRUMENT FOR THE ESTABLISHMENT OF THE RESTRUCTURED GLOBAL ENVIRONMENT FACILITY, EXECUTIVE DIRECTOR'S RESOLUTION NO. 94-2, GLOBAL ENVIRONMENT FACILITY TRUST FUND (1994); Freestone, *supra* note 104, at 16.

market fashioned after the currency market, principal of which is that floating pricing allows for wider participation in the market while preserving, and in fact promoting, environmental integrity. Adopting a currency approach would provide scope for the involvement of the IMF as adviser or supervisor.

Admittedly, the lack of a standard product, a ton of carbon, would add some complexity to international trading. However, in light of the removal of barriers for entry to the market, and the increase in the number of potential participants offered by the currency model, any extra burden of establishing a system for exchanges between differently weighted units is justified by the benefits described.

The characterization of carbon is a buried issue, because convergence between Kyoto and non-Kyoto trading systems has not yet occurred. The characterization of carbon should be done in a functional fashion so as to facilitate the creation of a trading system that maximizes economic and environmental benefits of environmental markets. Because carbon units are essentially synthetic assets, the international community has the opportunity to treat them however they wish: it should consider whether measuring carbon by the ton, like corn and soybeans, instead of measuring it as a unit whose value is reflective of the performance of the government that backs it, like Euros and Dollars, will hinder the convergence of these diverse markets, rather than facilitate it. Which approach to take should be agreed as a priority before the convergence of incompatible global carbon markets, and initial ICAP meetings in 2008 provide the ideal forum for these discussions to begin.