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COMMENT

Transnational Carbon-Trading Standards: Improving the Transparency and Coordination of Post-Kyoto Carbon Trading Markets

BRADEN SMITH*

I. INTRODUCTION

Carbon trading markets are operating or in development in the European Union (EU Emission Trading Scheme), Australia, New Zealand, Tokyo, Japan, and through regional initiatives in the United States. However, problems regarding the transparency of tradable carbon credits or offsets, especially the transnational monitoring of compliance with carbon emission limits established through national permits, have slowed the implementation of these initiatives.¹ Given the large question marks that still hover over the Kyoto Protocol's legally binding commitments,² and given the gridlock that plagues the United Nations Framework Convention on Climate Change (UNFCCC)

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1. See Henrik Hasselknippe, *Systems for carbon trading: an overview*, 3 CLIMATE POL'Y S43, S44 (2003).

2. See Kyoto Protocol to the United Nations Framework Convention on Climate Change art. 3, para. 1, Dec. 11, 1997, 2303 U.N.T.S. 148 [hereinafter Kyoto Protocol].

process, there is currently no internationally accepted method on how to monitor or verify emissions reductions that would allow carbon trading between distinct international markets.³ Given the slow progress of UNFCCC negotiations, an alternative approach may be to develop a transnational auditing standard that would allow participating members to adopt uniform standards for credits and offsets that would be both transparent to investors and enforceable.⁴

This Comment will provide a brief survey of the regulatory frameworks adopted by regional carbon trading markets to monitor, report, and verify (MRV) carbon emissions. It will then examine whether existing MRV regulations are sufficient to allow inter-regional cooperation between carbon trading markets, in particular, whether the MRV procedures are sufficient to allow the interchangeable carbon credits and offsets envisioned by the Kyoto Protocol.⁵ After reviewing the difficulties associated with creating harmonized MRV procedures in the absence of clearly delineated legal commitments in the Kyoto Protocol, the Comment will suggest how transnational environmental auditing standards might provide a temporary solution that will facilitate greater harmonization between regional markets in the absence of legally binding commitments from Annex I states.

II. BACKGROUND

The UNFCCC's Kyoto Protocol mandated that member states develop and implement monitoring, verification, and compliance measures that would allow the development of carbon trading markets.⁶ The vision of the Kyoto Protocol was to regulate carbon markets across national boundaries using the annual Conference

3. See Radoslav S. Dimitrov, *Inside Copenhagen: The State of Climate Governance*, 10 GLOBAL ENVTL. POL. 18 (2010).

4. See Paula C. Murray, *International Environmental Management Standard, ISO 14000: A Non-Tariff Barrier or a Step to an Emerging Global Environmental Policy*, 18 U. PA. J. INT'L ECON. L. 577 (1997).

5. Kyoto Protocol, *supra* note 2, at art. 17; United Nations Framework Convention on Climate Change, Oct 29-Nov. 10, 2001, Marrakesh, Morocco, 7th Sess., *Report of the Conference of the Parties*, 50, U.N. Doc. FCCC/CP/2001/13/Add.2 (Jan. 21, 2002) [hereinafter Kyoto Protocol Modalities, rules and guidelines].

6. Kyoto Protocol, *supra* note 2, at art. 17.

of Parties (COP) to set the rules and standards for each market.⁷ A single, coherent regulatory framework would allow the components of the Kyoto Protocol, such as the Clean Development Mechanism (CDM) and Joint Implementation (JI) projects, to work in tandem with international emissions trading markets in each country or region.⁸ A project funded under the CDM, such as setting aside 5,000 acres of rainforest in Brazil for conservation, could then be verified as either a carbon credit or an offset and traded to an Annex I country to allow a more efficient allocation of market resources.⁹

The development of international carbon trading markets has made slow progress since 1997, but current discussions have become bogged down in finger-pointing between Annex I states, and the rapidly growing non-Annex I developing countries, such as China, India, and Brazil.¹⁰ Despite technical developments in MRV procedures taking place in the UNFCCC's Subsidiary Body for Scientific and Technical Advice (SBSTA), the commitment of Kyoto parties to participating in international trading of carbon credits has waned. A tentative agreement at the seventeenth meeting of the UNFCCC's Conference of Parties in Durban (COP 17) to continue the Kyoto legally binding commitments beyond 2012 will depend on negotiators being able to bridge the gap between Annex I and non-Annex I parties.¹¹

Although carbon trading within the Kyoto Protocol appears to be stalled, carbon trading markets continue to develop regionally. The European Union's Emissions Trading Scheme (ETS), launched in 2005, includes a formalized auditing process,

7. *Id.* at art. 3, para. 4.

8. Edwin Woerdman, *Implementing the Kyoto protocol: why JI and CDM show more promise than international emissions trading*, 28 ENERGY POL'Y 1, 29-30 (2000).

9. *Id.*

10. Gloria Jean Gong, *What China wants: China's climate change priorities in a post-Copenhagen world*, 23 GLOBAL CHANGE, PEACE & SEC. 159, 171 (2011).

11. Interviews with climate change negotiators from Pacific Small Island Developing States (PSIDS). Negotiations to determine the future of legally binding international commitments will now be carried out under a separate institutional framework called the Ad Hoc Working Group on the Durban Platform for Enhanced Action. United Nations Framework Convention on Climate Change, Durban, S. Afr., Nov. 28-Dec. 11, 2011, *Report of the Conference of the Parties on its Seventeenth Session*, 6, U.N. Doc. FCCC/CP/2011/9/Add.1 (Mar. 15, 2012).

an extensive monitoring and verification system, and an active, if not particularly well-regulated, carbon offset market.¹² Australia has a plan in place for emissions trading to begin in 2012, but political developments in the country will likely push back implementation until 2013.¹³ New Zealand has a functional carbon market, with a well-regulated monitoring and verification regime, but has not implemented any emissions caps.¹⁴ There are plans in Japan to develop a nationwide market, but it currently remains regional.¹⁵

Even within the United States, carbon markets are developing at a regional level. The Regional Greenhouse Gas Initiative (RGGI) in the Northeast and Mid-Atlantic includes a commitment to use carbon trading to reduce greenhouse gas emissions by 10% by 2020.¹⁶ So far, the program is designed to target emissions from fossil fuel-fired electric power generators, which is less ambitious than most carbon trading markets.¹⁷ California's carbon trading scheme is similar, but progress has been delayed due to logistical problems.¹⁸ The situation in the United States is even more difficult given the concurrent authority of the federal government, and the U.S. EPA's plan to regulate greenhouse gas emissions through its existing authority (as a consequence of *Massachusetts v. EPA*).¹⁹

Monitoring and enforcement of a carbon trading market is an extremely technical process, requiring close cooperation between

12. A. Denny Ellerman & Barbara K. Buchner, *The European Union Emissions Trading Scheme: Origins, Allocation, and Early Results*, 1 REV. ENVTL. ECON. & POL'Y 66, 67-69 (2007).

13. Regina Betz & Anthony D. Owen, *The implications of Australia's carbon pollution reduction scheme for its National Electricity Market*, 38 ENERGY POL'Y 4966 (2010).

14. Slobodan Perdan & Adisa Azapagic, *Carbon trading: Current schemes and future developments*, 39 ENERGY POL'Y 6040, 6045-46 (2011).

15. *Id.* at 6046-47.

16. Richard B. Stewart, *States and Cities As Actors in Global Climate Regulation: Unitary vs. Plural Architectures*, 50 ARIZ. L. REV. 681 (2008).

17. Perdan & Azapagic, *supra* note 14, at 6044-45.

18. Cal. EPA Air Res. Bd., *Cap and Trade Program*, CA.GOV, <http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm> (last visited Sept. 30, 2012).

19. *Massachusetts v. EPA*, 549 U.S. 497, 532 (2007) (establishing EPA authority to regulate greenhouse gases under the Clean Air Act); Jody Freeman & Adrian Vermeule, *Massachusetts V EPA: From Politics to Expertise*, 2007 SUP. CT. REV. 51, 72 (2007).

public and private sectors. Even Annex I developed countries are having difficulty establishing robust monitoring and enforcement regimes, and those states that have implemented carbon trading markets are finding that without transparency between investors, emitters, and carbon brokers, actual emissions as credited may not reflect the real reduction of emissions.²⁰ The EPA's roll-out of its emissions monitoring regulations provide a good example of the technical problems associated with monitoring emitters on an annual basis. It calls for annual submissions of greenhouse emissions, but so far the agency has refused to bring enforcement actions against emission sources that declined to submit a 2011 report.²¹ Although some high-tech solutions are being developed, like monitoring from satellites, it remains very difficult for third parties to monitor changes in emissions.²² Interested third parties, such as brokers looking for offsets in developing countries, are often at the mercy of voluntary or non-existent domestic regulations. Rainforests that are accounted for on a company's books may not be conserved long enough to qualify as an offset.

Properly regulated tradable emissions credits are the life-blood of a successful market-based approach to reducing greenhouse gas emissions. The credit is an artificial construct created by market regulators to transform amorphous, and often unrelated, human activities, such as raising livestock or operating a natural-gas fired power plant, into a single, comparable commodity.²³ Through the work of scientists at the Intergovernmental Panel on Climate Change (IPCC) and the UNFCCC, an emission unit has become universally defined as

20. Peter Bohm, *International Greenhouse Gas Emissions Trading—With Special Reference to the Kyoto Protocol*, in EFFICIENCY AND EQUITY OF CLIMATE CHANGE POLICY (Carlo Carraro ed., 2000).

21. Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 56,259, 56,379-80 (Oct. 30, 2009) (to be codified at 40 C.F.R. pt. 98).

22. Ake Rosenqvist et al., *A review of remote sensing technology in support of the Kyoto Protocol*, 6 ENVTL. SCI. & POL'Y 441, 441 (2003).

23. Some have described it as a currency. The difference might seem slight, but its implications are important for how regulators decide to treat market activity. For the purposes of this paper, carbon credits will be treated as a commodity, albeit, a heavily regulated one. See Jillian Button, Note, *Carbon: Commodity or Currency? The Case for an International Carbon Market Based on the Currency Model*, 32 HARV. ENVTL. L. REV. 571 (2008).

one ton of a CO₂ equivalent greenhouse gas.²⁴ Like any commodity, certain important differences are lost during the standardization process. For example, methane has other features that make it a potentially more problematic greenhouse gas, but for the purposes of a tradable scheme, it gets treated as equivalent to carbon dioxide so that the emission of either gas can be tradable.²⁵ The Kyoto negotiators could have tried to treat each gas separately, but proponents of market-based approaches were strong advocates of a standardized approach, in part because standardization allows carbon-trading markets to achieve a greater level of efficiency.²⁶ Every participating industry can then calculate its baseline emissions in the form of CO₂ equivalent greenhouse gases, allowing a sheep rancher in New Zealand to trade its carbon-emitting activity with an airline operator in London.

Once the market regulator establishes a standardized unit of measurement, it can then establish a cap. The cap is the total amount of carbon that can be emitted by regulated industries during a given year (this could be any time interval, but annual reporting is the most commonly used method). Various market regulators have established caps using different methods. For those countries participating in the Kyoto Protocol, one would assume that the cap to use would be their country's legally binding commitment contained in Annex I.²⁷ However, for political reasons, most regulators have adopted caps that reference Annex I commitments, but with yearly limits that are deliberately less stringent than would otherwise be required.²⁸

24. See, e.g., TASK FORCE ON NAT'L GREENHOUSE GAS INVENTORIES, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, REVISED 1996 IPCC GUIDELINES FOR NATIONAL GREENHOUSE GAS INVENTORIES (1996).

25. Daniel A. Lashof & Dilip R. Ahuja, *Relative contributions of greenhouse gas emissions to global warming*, 344 NATURE 529, 529-31 (1990).

26. Leif Gustavsson et al., *Project-based greenhouse-gas accounting: guiding principles with a focus on baselines and additionality*, 28 ENERGY POL'Y 935, 936 (2000).

27. See Kyoto Protocol, *supra* note 2, at art. 3.

28. For example, the European Union is operating under a cap that commits to reducing the region's GHGs by 20% by 2020. Council Directive 2009/406, 2009 O.J. (L 140) 136, 137 (EC) (decision of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020). In its March 2007 Directive, the Council

Of the most substantial carbon-trading markets in operation worldwide, only the Regional Greenhouse Gas Initiative (RGGI), which operates under a Memorandum of Understanding between Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont, has set emission reduction targets without any reference to the Kyoto commitments.²⁹

The cap is then used to produce a tradable credit, which is typically calculated as a certain share of CO₂ equivalent greenhouse gases. Shares are then allocated to different emitters based on either an auction, the historical needs of the industry, or through a random distribution.³⁰ An emitter must have the necessary carbon credits in order to emit its annual share of CO₂ equivalent greenhouse gases. If they are short in a given year, they can purchase additional credits, reduce emissions to the allowable amount, or pay a penalty. Most markets, especially those that allocate credits through an auction, will allow intermediaries, such as brokers, to purchase and trade credits.³¹

In an ideal world, brokers improve market liquidity by allowing emitters to more easily buy and sell credits depending

recognized that this was insufficient, but said that a higher cap of around 30% would only take place “provided that other developed countries commit themselves to comparable emission reductions and economically more advanced developing countries commit themselves to contributing adequately according to their responsibilities and capabilities.” *Id.* at 136.

29. The United States was a signatory to the original Kyoto Protocol, and was instrumental in negotiating the agreed-upon commitments, but withdrew its intention to ratify in 2001. RGGI is a regional initiative based on an independently set cap negotiated between the participating state governments. Regional Greenhouse Gas Initiative Memorandum of Understanding 2-3 (Dec. 20, 2005), *available at* http://www.rggi.org/docs/mou_final_12_20_05.pdf. New Jersey’s governor has recently expressed his desire to withdraw from RGGI; however, state legislators are challenging the governor’s authority to withdraw. Mireya Navarro, *Christie Pulls New Jersey From 10-State Climate Initiative*, N.Y. TIMES, May 27, 2011, at A20.

30. The U.S. EPA provides an excellent handbook that introduces the basic features of a cap and trade system. EPA OFFICE OF AIR & RADIATION, EPA430-B-03-002, TOOLS OF THE TRADE: A GUIDE TO DESIGNING AND OPERATING A CAP AND TRADE PROGRAM FOR POLLUTION CONTROL 3.14-3.23 (2003), *available at* <http://www.epa.gov/airmarkets/resource/docs/tools.pdf> [hereinafter OFFICE OF AIR & RADIATION].

31. *See, e.g.*, U.N. ENV’T PROGRAMME, DIV. OF TECH., INDUS., & ECON., AN EMERGING MARKET FOR THE ENVIRONMENT: A GUIDE TO EMISSIONS TRADING 4-8 (2002) [hereinafter DIV. OF TECH., INDUS., & ECON.].

on changes in their industry.³² For example, coal-fired power plant operators saddled with older facilities can calculate whether investing in new technology would be more cost-effective than purchasing credits. A command and control approach, exemplified by the Clean Air Act's technology provisions, would only focus on mandating new technology.³³ A carbon market is still regulatory, in the sense that it forces market participants to make decisions based on external factors, but allows emitters greater flexibility. For international carbon-credit transactions, brokers play a particularly important role because emitters are generally reluctant to enter contractual arrangements with other emitters without a firm commitment that they will receive a specified amount of credits. Brokers can more easily commit to purchasing credits created through offsets because at the end of the year they are not liable if an eventual offset produces less credits than was originally anticipated.³⁴

In practice, a tradable emissions system, whether implemented between states or between companies, should produce an economically efficient outcome for all participating parties. A company whose average cost of making technological improvements to reduce carbon emissions is comparatively high can use a market-based system to buy permits to allow higher levels of emissions. Likewise, a company whose average cost is comparatively low can profit by selling credits gained through emission reductions. If the regulating authority commits to periodically reducing the overall permitted level of emissions, significant emission reductions can be achieved without imposing as high a cost on the average emitter.³⁵

This system works particularly well for greenhouse gas emissions because the cumulative effect of anthropogenic warming of Earth's climate is felt globally, rather than locally. For example, if a particular emitter of mercury were allowed to buy permits to emit more mercury in a year than another facility,

32. Paul G. Miclăuș et al., *Testing the Efficiency of the European Carbon Futures Market using Event-Study Methodology*, 2 INT'L J. ENERGY & ENV'T 121, 121 (2008) (modeling the efficiency of futures price-setting in the EU Emission Trading Scheme).

33. OFFICE OF AIR & RADIATION, *supra* note 30, at 2.1-2.5.

34. *See* DIV. OF TECH., INDUS., & ECON., *supra* note 31, at 10.

35. *See id.* at 36-37.

a region downwind of that facility would suffer disproportionate health effects.³⁶ Although that result might be economically efficient from an emitter's perspective, the subsequent harm caused to the downwind community might be considered an unacceptable trade-off. However, allowing a facility to emit more CO₂ will generally not cause localized, adverse health effects to a downwind community.³⁷ Of course, this is also one of the primary reasons why limiting CO₂ emissions is such a difficult public policy problem. Maintaining a climate suitable for human habitation and growth is as close to a pure public good as economics can hypothesize, which makes it all the more difficult for states to properly assign the costs of regulating such a good.³⁸

Carbon markets achieve greater economic efficiency when they include a larger number of market participants.³⁹ Domestically, this is taking place by expanding the number of industries participating in carbon-trading schemes. For example, the EU's ETS began by targeting fossil fuel-fired electrical energy generators, which are typically easiest to incorporate into a regulatory scheme because they are likely already being monitored for other emissions, such as hazardous pollutants.⁴⁰ However, non-point sources of carbon emissions, such as automobiles, agricultural production, and the airline industry actually emit a greater percentage of the EU's annual emissions.⁴¹ Since the EU's ETS was originally designed to

36. See Kris Christen, *Perspective: Mercury trading scheme raises concerns*, 38 ENVTL. SCI. & TECH. 126A (2004).

37. It is important to note that CO₂ is rarely the only gas emitted from an industrial facility. A tradable emissions scheme may be a good method of reducing overall emissions, but it cannot substitute for technology- or air-quality-based regulations of other harmful pollutants.

38. The two key components of a public good is that it is non-rival, in other words "each individual's consumption of such a good leads to no subtractions from any other individual's consumption of that good," and non-excludable. Paul A. Samuelson, *The Pure Theory of Public Expenditure*, 36 REV. ECON. & STAT. 387, 387 (1954).

39. See Valentina Bosetti et al., *Banking Permits: Economic Efficiency and Distributional Effects* 12 (Ctr. for Econ. Policy Research, Working Paper No. 6652, 2008).

40. Council Directive 2003/87, 2003 O.J. (L 275) 32 (EC) (establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC).

41. DIRECTORATE GEN. FOR ENERGY & TRANSPORT, EUROPEAN COMMISSION, EU ENERGY FIGURES IN 2010 2 (2010).

eventually meet the Kyoto Protocol's Annex I commitments for each European country, skeptics were quick to point out that the ETS's limited applicability placed electrical energy generators at a severe disadvantage.⁴² If the ETS became the primary mechanism for complying with Kyoto, the electrical energy generators (and those industries that depend heavily on electricity) would be forced to shoulder a disproportionately large share of the burden.

Thus, since the creation of the ETS, the Commission has tried to gradually expand the number of participating industries. This produced a significant amount of controversy when the Commission included Europe's air carriers.⁴³ The airline industry faces intense international competition, and the airlines argued that the ETS would place them at a disadvantage. New Zealand appears to have learned a valuable lesson from the EU's experience, because its market already encompasses a more diverse set of market participants, including agricultural farms and forestry products.⁴⁴ Yet, even a more diverse mixture of market participants does not guarantee a market that trades with enough volume to ensure adequate protections against unfair market practices. The EU's system has been criticized for being notoriously thin, and susceptible to market manipulation.⁴⁵ New Zealand's system is also very thin, with only ninety-six mandatory participants as of June 2011, although that number will rise once additional sectors are brought into the system.⁴⁶

One of the biggest challenges for carbon trading is the high transaction costs associated with establishing MRV procedures.⁴⁷ Since the thin line between profit and loss in a carbon market

42. Stephen Gardner, *EU ETS: The Winners and Losers of EU Carbon Trading*, KLEANINDUSTRIES (Sept. 22, 2008), http://www.kleanindustries.com/s/environmental_market_industry_news.asp?ReportID=320988.

43. See M. Vittoria Giugi Carminati, *Clean Air & Stormy Skies: The EU-ETS Imposing Carbon Credit Purchases on United States Airlines*, 37 SYRACUSE J. INT'L L. & COM. 127 (2010).

44. Perdan & Azapagic, *supra* note 14, at 6045-46.

45. See Marius-Cristian Frunza et al., *Missing trader fraud on the emissions market*, 18 J. FIN. CRIME 183 (2011).

46. NEW ZEALAND MINISTRY FOR THE ENV'T, REPORT ON THE NEW ZEALAND EMISSION TRADING SCHEME 7 (2011) [hereinafter N.Z. EMISSIONS TRADING SCHEME].

47. Robert N. Stavins, *What Can We Learn from the Grand Policy Experiment? SO₂ Allowance Trading*, 12 J. ECON. PERSP. 69 (1998).

depends on the reliability and long-term trajectory of emissions by market participants, confidence in the market can only be developed if each participant can trust that emissions are properly monitored, verified by an independent agency, and that any violators are appropriately punished.⁴⁸ In economics, these represent classic transaction costs. A carbon market is unlikely to succeed without a strong, independent regulatory agency ensuring that each market participant plays by the rules. Independent regulation by industry will not generate the level of confidence in emissions reductions necessary for financial brokers to enter the market and assume a proportion of the liability associated with trading carbon emission credits.

III. IMPORTANCE OF MONITORING, REPORTING, AND VERIFICATION PROCEDURES

Unlike other commodities, carbon credits are not easily distinguishable physical objects. Creating a credit depends on (1) the accuracy of the measurement techniques used to determine the level of emitted CO₂ equivalent greenhouse gases, (2) recognition by a market regulator that an emitter has demonstrated an overall change in their level of annual emissions, (3) independent verification that industry reporting reflects an actual reduction rather than an accounting gimmick, and finally, (4) recognition by buyers that an emission-reduction can be properly credited to the seller.⁴⁹ MRV procedures, which have been widely used in a variety of market-based regulatory approaches, become vitally important for maintaining the integrity, transparency, and vitality of carbon-trading markets.⁵⁰ MRVs can include a variety of different elements, but typically involve the use of either continuous or on-site monitoring by an independent agency, electronic records kept by the emitter and available for auditing at the request of a market regulator, trained and competent on-site inspectors with the authority to

48. *Id.* at 79.

49. Verification includes not only appropriate recognition by the market regulator that a reduction has taken place, but also assurances against fraud or misrepresentation.

50. John Schakenback et al., *Fundamentals of Successful Monitoring, Reporting, and Verification under a Cap-and-Trade Program*, 56 J. AIR & WASTE MGMT. ASS'N 1576, 1576 (2006).

extensively review a company's emission records, and incentives or penalties with sufficient size to deter any potential fraud or negligence.⁵¹

The U.S. EPA's NO_x Budget Trading Program and its Acid Rain Program, both market-based tradable emissions schemes, provide an excellent example of successfully implemented MRVs. Both programs are built on strong equipment performance standards, which ensure that monitoring techniques and technologies are up to the challenge of providing a reliable data stream.⁵² That data is stored electronically, and the EPA provides the emitter with software allowing the reporter to identify and potentially correct any errors before submitting a compliance report.⁵³ Emitter self-reporting is then supplemented with a rigorous random audit and inspection process based on identifying any statistical anomalies in the emitter's electronic records that might suggest fraud or mistake.⁵⁴ An incentive and penalty system functions as a supplement to these quality assurance measures, bringing a larger percentage of the regulated industry into voluntary compliance.⁵⁵ A significant amount of time is spent collaborating with emitting sources to determine how to minimize errors and avoid unintended noncompliance.

High quality MRVs are vital in order to establish confidence in the value of a credit. Hypothetically, market regulators should be able to manage the risk and distribution of credits by tweaking the cap. However, as the EU's regulators learned, errors in calculating the cap or significant policy adjustments can cause massive fluctuations in the value of a credit in the domestic market.⁵⁶ When those fluctuations are the result of the market anticipating or reacting to a regulatory agency's decision, outside investors or brokers, which are vital to a successfully operating system, may conclude that the market is too risky to successfully

51. *Id.* at 1577.

52. *Id.* at 1579.

53. *Id.* at 1580-81.

54. *Id.* at 1577-78.

55. *Id.*

56. Regina Betz & Misato Sato, *Emissions Trading: Lessons Learnt from the 1st Phase of the EU ETS and Prospects for the 2nd Phase*, 6 *CLIMATE POL'Y* 351, 352 (2006).

manage. It may also result in rapid changes in the retail price of energy, undermining the public's confidence in the system's reliability.⁵⁷

Although command and control regulatory structures also emphasize MRVs, the threat of litigation and the absence of any intrinsic motive to comply other than the avoidance of liability mean that greater time is often spent investigating and punishing.⁵⁸ The difficulty with market-based regulations is that persistent regulatory noncompliance will not only result in poor outcomes (increased pollution), but will also undermine confidence in the value of tradable emissions, thereby endangering the value of a credit to other market participants.⁵⁹ This is a double-edged sword. On the one hand, compliance appears to be even more important, which places much of the success or failure of a market in the hands of market regulators. However, firms that participate want to realize gains from participating in the market, which should provide an incentive to maintain the overall integrity of the MRV process.

It may be easy to dismiss MRV procedures as a technical matter with limited applicability to the design and functioning of the overall carbon trading system. In a fully integrated, well-regulated, harmonized national regulatory structure, MRVs can be taken for granted. However, the current regulatory landscape includes a messy combination of national authorities, international agreements, and private third-party brokers. If the goal is to create a seamless international market for carbon, and thus realize the greater efficiencies from international trading, market participants must be confident that a credit created and sold in the EU's ETS is legally recognized as equivalent to a credit in New Zealand's ETS. As a pioneer in carbon trading and an international promoter of emissions trading through the Kyoto Protocol, the EU has taken the most active approach to promoting

57. *Id.*

58. See Robert W. Hahn & Robert N. Stavins, *Economic Incentives for Environmental Protection: Integrating Theory and Practice*, 82 AM. ECON. REV. 464 (1992).

59. Tseming Yang, *The Problem of Maintaining Emission "Caps" In Carbon Trading Programs Without Federal Government Involvement: A Brief Examination of the Chicago Climate Exchange and the Northeast Regional Greenhouse Gas Initiative*, 17 FORDHAM ENVTL. L. REV. 255, 273 (2006).

linkages with other carbon markets.⁶⁰ In an April 23, 2009 Directive, the EU's Council and Parliament attempted to promote linkages by instructing that operators in the EU be given assurances that carbon credits created pursuant to the Kyoto Protocol be recognized as valid credits in the EU ETS.⁶¹ However, the Directive acknowledged that "a procedure should be established" that would exclude credits that did not represent "real, verifiable, additional[,] and permanent emission reductions and have clear sustainable development benefits."⁶² This reflected the Council's concerns that Kyoto's MRV procedures were not rigorous enough to meet the EU ETS standards. It also reflected growing concern that the Kyoto Protocol's system might become legally inoperative if an agreement was not reached on extending the treaty's legally binding commitments.⁶³

Even within Europe, harmonizing MRV procedures has proven difficult. Some EU members have extremely well-funded and technically capable environmental ministries employing state-of-the-art continuous monitoring of major emitters. Others, especially the new Eastern European members, do not have the resources to implement such a sophisticated program. The EU's Directive on MRV procedures allows members to employ either a CEM-type system, or a factor-analysis approach, whereby emissions are calculated based on an emitter's activity data in conjunction with a standard set of factors developed by technical experts.⁶⁴ Ideally, the two approaches should yield similar results. However, a calculation-based approach depends far more on self-reporting, and can lead to allegations of under-reporting that undermine the market's confidence in the system's integrity, especially if the national regulatory authority fails to invest in

60. Atle C. Christiansen & Jørgen Wettstad, *The EU As Frontrunner on Greenhouse Gas Emissions Trading: How Did It Happen and Will the EU Succeed?*, 3 *CLIMATE POL'Y* 3, 10 (2003).

61. Council Directive 2009/29, 2009 O.J. (L 140) 63 (EC).

62. *Id.* at 67.

63. Diarmuid Torney & Noriko Fujiwara, *National Commitments, Compliance and the Future of the Kyoto Protocol 2-4* (Ctr. for European Policy Studies, Working Paper No. 226, 2010).

64. Commission Decision 2007/589, 2007 O.J. (L 229) 1, 11 (EC).

adequate compliance procedures.⁶⁵ Since the EU's ETS depends on national-level implementation, different standards can produce regulatory arbitrage and allegations of fraud.⁶⁶

IV. INTERNATIONAL APPROACHES TO IMPROVING MRV PROCEDURES

Although carbon-market participants might recognize the need for more transparent, standardized MRV procedures to facilitate market linkages, there is no agreed-upon approach to achieve this goal. The following sections will discuss and evaluate the effectiveness of three ideal-type approaches, including (1) strengthening the international regulatory framework, (2) harmonizing national policies through bilateral or multilateral agreements, and (3) establishing transnational MRV procedures and auditing processes. No single approach is sufficient to address the challenge posed by inter-market carbon trading, but of the three options, a combination of policy harmonization and establishing internationally recognized, market-based transnational MRV procedures is likely to provide the most feasible solution.

A. Strengthening the Kyoto Protocol

In the late 1990s, international consensus appeared to favor emissions trading that would take place through a comprehensive international regulatory framework.⁶⁷ The Kyoto Protocol contains an agreed-upon set of technical definitions, rules, and procedures to allow the trading of carbon credits between countries. Article 17 provides that member states “define the relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability for emissions trading.”⁶⁸ That vague proscription was later transformed into a

65. John K. Stranlund, James J. Murphy, & John M. Spraggon, *An Experimental Analysis of Compliance in Dynamic Emissions Markets*, 62 J. ENVTL. ECON. & MGMT. 414, 427 (2011).

66. Jon Birger Skjaereth, *EU Emissions Trading: Legitimacy and Stringency*, 20 ENVTL. POL'Y & GOVERNANCE 295, 305 (2010).

67. For a good example of this type of optimism, see Stuart Eizenstat, *Stick with Kyoto: A Sound Start on Global Warming*, 77 FOREIGN AFF. 119 (1998).

68. Kyoto Protocol, *supra* note 2, at art. 17.

market-based mechanism for the trading of emissions credits, including Emission Reduction Units (ERU), Certified Emission Reductions (CER), Assigned Amount Units (AAU), or Removal Units (RMU).⁶⁹ Each unit relates to an institutional or financial mechanism established by the UNFCCC to promote the trading of emissions between Annex I countries (historically high emitters that have made legally binding commitments to reduce emissions on average 5% below 1990 levels by 2012) and between Annex I countries and non-Annex I countries.⁷⁰

For example, an ERU is generated by reducing one ton of CO₂ equivalent greenhouse gas emissions by establishing a Joint Implementation (JI) project⁷¹ with, typically, a non-Annex I country. To be credited with an ERU, a project must meet the rules and guidelines established by the JI Supervisory Committee.⁷² If the project meets the Supervisory Committee's approval, it will be granted a positive determination that verifies that the project may submit additional documentation proving a reduction in a certain amount of CO₂ equivalent greenhouse gases that may be credited to the project's Annex I partner. So far, thirty-two positive determinations have been made during the initial 2008-2012 commitment period under the Kyoto Protocol.⁷³ In one such project, the Netherlands received a positive determination for a JI project with the Russian Federation to reduce the perfluorocarbon (PFC) emissions of a Russian aluminum smelter by roughly 749,265.0 t of equivalent

69. United Nations Framework Convention on Climate Change, Montreal, Can., Nov. 28-Dec. 10, 2005, *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol on its first session*, 3, U.N. Doc. FCCC/KP/CMP/2005/8/Add.2, Advance Version (Mar. 30, 2006) [hereinafter UNFCCC RCPSMPKP Adv.]; Kyoto Protocol Modalities, rules and guidelines, *supra* note 5.

70. *Id.*

71. *Id.* at art. 6.

72. United Nations Framework Convention on Climate Change, Montreal, Can., Nov. 28-Dec. 10, 2005, *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol on its first session*, U.N. Doc. FCCC/KP/CMP/2005/8/Add.2 (Mar. 30, 2006) [hereinafter UNFCCC RCPSMPKP].

73. United Nations Framework Convention on Climate Change, *Annual Report of the Joint Implementation Supervisory Committee to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol*, U.N. Doc. FCCC/KP/CMP/2011/4 (Oct. 24, 2011).

CO₂, which once certified, would generate an equal number of tradable ERUs.⁷⁴

A similar process exists for the Kyoto Protocol's Clean Development Mechanism (CDM). A CDM project typically involves a capital investment by an Annex I country, such as an upgrade to mass transportation infrastructure or the provision of low-cost energy alternatives in rural areas.⁷⁵ CDMs have been far more popular than JIs, in part because they function more like traditional foreign aid. Like the Ji, the CDM has an Executive Board mandated to review and approve CDM projects.⁷⁶ A state or private investor will design a project, receive approval for the project from the national government, validate the project with an approved third-party, register with the CDM's Executive Board, receive independent verification of the extent of the project's success, and finally, receive an issuance of a CER from the Executive Board. That CER can then be traded between states, or on a private carbon trading market.⁷⁷

Although much of the action of the Kyoto Protocol has taken place within the CDM, and to a much smaller extent, the Ji, the foundation of the Protocol rests with the AAUs and RMUs. An AAU is the assigned amount of permitted greenhouse gas emissions assessed to each Annex I country in the Kyoto Protocol.⁷⁸ If a global carbon trading market between Annex I countries actually existed, AAUs would be integral to the success of the Kyoto Protocol's commitments. RMUs are a bit more complicated. One RMU is equal to one metric ton of CO₂ equivalent greenhouse gases absorbed by a carbon sink, such as

74. DET NORSKE VERITAS, DETERMINATION REPORT NO. 2008-1624: REDUCTION OF PFC EMISSIONS FROM RUSAL KRASNOYARSK ALUMINUM SMELTER IN RUSSIAN FEDERATION 7-11 (Oct. 22, 2008); *Reduction of perfluorocarbons emissions from RUSAL Krasnoyarsk Aluminium Smelter*, UNFCCC JOINT IMPLEMENTATION ADVISORY COMM., <http://ji.unfccc.int/JIITLProject/DB/6FU0T3C7WY5XWTR9EM5JQD5RDVHDSI/details> (last visited Oct. 21, 2012).

75. The CDM's Executive Board maintains a searchable listing of approved project activities. *Project Search*, CLEAN DEV. MECHANISM, <http://cdm.unfccc.int/Projects/projsearch.html> (last visited Oct. 7, 2012).

76. UNFCCC RCPSMPKP, *supra* note 72, at 4.

77. *See generally* CLEAN DEV. MECHANISM EXEC. BD., SOURCE PROVISIONS OF THE CLEAN DEVELOPMENT MECHANISM PROJECT CYCLE PROCEDURE 10 (2011).

78. UNFCCC RCPSMPKP, *supra* note 72, at 24.

landfills or carbon capture and storage facilities.⁷⁹ Despite substantial effort to reach agreement on how to measure and credit RMUs, carbon sinks remain a particularly contentious issue.⁸⁰ Developing countries see RMUs as a way for developed countries to avoid meeting Kyoto commitments. The only carbon sinks that have been successfully incorporated into a Kyoto carbon trading unit are those afforestation and reforestation efforts that have been certified by the CDM's Executive Board.⁸¹

B. Kyoto's MRV Procedures

The Kyoto Protocol did not attempt to mandate the use of MRV procedures at the national level. Instead, each tradable unit was based on a separate MRV procedure. The AAUs, which were designed to be the principal unit of exchange in a Kyoto-based emission trading system, would be calculated from GHG inventories submitted annually by all Annex I countries.⁸² The reporting requirements largely adopted the methodologies of the 1996 IPCC Guidelines for National Greenhouse Gas Inventories, which required countries to (1) identify sources and sinks according to a list of categories established by the IPCC, (2) identify a relevant time-period for the source or sink (such as three-year average), (3) report each estimate of emissions for the category in gigagrams, including any uncertainty range, if applicable, (4) verify the amount with independently published estimates and against the IPCC's own reference guidelines, and (5) document the methodologies, assumptions, and measurements

79. A carbon sink may also involve land use decisions, such as the preservation of an existing forest otherwise targeted for removal. Crediting natural carbon sinks is particularly controversial because it seems a lot like blackmail: I will refrain from destroying my environment if you provide me with a sufficiently high payoff.

80. See Eric C. Betteheim & Gilonned' Origny, *Carbon Sinks and Emissions Trading under the Kyoto Protocol: A Legal Analysis*, 360 PHIL. TRANSACTIONS ROYAL SOC'Y 1827 (2002).

81. See CLEAN DEV. MECHANISM EXEC. BD., PROJECT DESIGN DOCUMENT, ABERDARE RANGE / MT. KENYA SMALL SCALE REFORESTATION INITIATIVE (Jan. 17, 2011), available at http://cdm.unfccc.int/filestorage/5/H/2/5H2VLI89413SFPXUQGCJBNE7K6OWYA/PDD_KirimaraKithithina_ver.05?t=MTh8bWJqdDhnfDCbJzqAklKjOFFBySGRdf8.

82. UNFCCC RCPSMPKP, *supra* note 72, at 18.

used to complete the inventory.⁸³ Each inventory report would then receive an individual review by a technical body of the secretariat.⁸⁴ In 2003, following an initial trial period, the eighth meeting of the conference of the parties (COP 8) agreed to make submissions mandatory for all Annex I parties. COP 8 undertook to revise and streamline the review process, and established expert review teams (ERTs) to ensure that each country was complying with its reporting requirements.⁸⁵

The ERT process has improved the quality of country-level GHG inventory reports. Annex I countries now receive detailed feedback from ERTs on the measurement methods employed in each IPCC category, including recommendations on best practices and suggestions for more accurate estimation methods.⁸⁶ For example, the report on Iceland's 2011 submission noted that "some mandatory categories are reported as not estimated . . . in particular, CO₂ emissions and removals from mineral soils under cropland and grassland . . ." ⁸⁷ This type of detailed review provides technical guidance meant to gradually push all Annex I countries toward more standardized GHG reporting procedures. However, the limits of this process are quickly apparent. The IPCC guidelines are generic, and often do not reflect the realities of the country's energy output. Some countries, such as Ukraine, rely heavily on IPCC methods rather than preparing data based on actual surveys of the country's industrial emitters.⁸⁸ Since AAs are calculated based on an initial report submitted by Annex I countries on January 1, 2007 (or one year after the entry into force of the Kyoto Protocol), minor variations in reporting

83. TASK FORCE ON NAT'L GREENHOUSE GAS INVENTORIES, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, REVISED 1996 IPCC GUIDELINES FOR NATIONAL GREENHOUSE GAS INVENTORIES 2.1-2.7 (1996), available at <http://www.ipcc-nggip.iges.or.jp/public/gl/invs4.html>.

84. UNFCCC RCPSMPKP, *supra* note 72, at 26-27.

85. See UNFCCC RCPSMPKP Adv., *supra* note 69.

86. See UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, KYOTO PROTOCOL REFERENCE MANUAL ON ACCOUNTING OF EMISSIONS AND ASSIGNED AMOUNT 26-28 (2008).

87. United Nations Framework Convention on Climate Change, *Report of the individual review of the annual submission of Iceland submitted in 2011*, 9, U.N. Doc. FCCC/ARR/2011/ISL (Dec. 19, 2011).

88. United Nations Framework Convention on Climate Change, *Report of the individual review of the annual submission of Ukraine submitted in 2011*, 53, U.N. Doc. FCCC/ARR/2010/UKR (June 3, 2011).

methods from year-to-year can result in substantial adjustments to a country's available AAUs.⁸⁹

This is an important problem because the AAU trading system is supposed to function as a relatively decentralized market exchange. National registries created by all thirty-eight signatories serve as accounts for the country's AAUs. The government, or an entity legally recognized by the government, will register its credits through the national system.⁹⁰ If a seller in the EU's ETS, for example, seeks a trade with a buyer in New Zealand, an international transaction log (ITL) kept by the UNFCCC secretariat will verify the transaction by checking the national registry with other national registries to ensure a match.⁹¹ The procedures are laid out in data exchange standards adopted by the UNFCCC's Subsidiary Body for Scientific and Technological Advice (SBSTA).⁹² The ITL system functions in conjunction with the CDM registry, which accounts for all CERs approved by the CDM's Executive Board.⁹³ The system is designed to provide a seamless platform for trading Kyoto credits between countries. Unfortunately, due to technical delays and a lack of participation, the majority of tradable credits being registered by the system are primarily CERs.⁹⁴ There has yet to develop a market for tradable AAUs, in part because the primary trading partners are members of the EU ETS, which keeps a separate, but complementary registry for transactions taking place within the European Community.⁹⁵ New Zealand's proposed ETS will utilize Kyoto credits, so there is the potential that the ITL will serve as a clearinghouse for trades between New Zealand and the EU, but so far its functionality is limited primarily to registering CERs and crediting national registries with emissions reductions.⁹⁶

89. UNFCCC RCPSMPKP, *supra* note 72, at 23.

90. *Id.* at 28.

91. *Id.*

92. See United Nations Framework Convention on Climate Change, Subsidiary Body for Scientific and Technological Advice, *Data Exchange Standards for Registry Systems under the Kyoto Protocol* (Dec. 16, 2010).

93. UNFCCC RCPSMPKP, *supra* note 72, at 31.

94. Cameron Hepburn, *Carbon Trading: A Review of Kyoto Mechanisms*, 32 ANN. REV. ENVTL. RESOURCES 375, 380 (2007).

95. *Id.* at 380-81.

96. Perdan & Azapagic, *supra* note 14, at 6046.

Since the CDM's Executive Board is granted the authority to review and approve new projects according to standards and methods developed independently from the GHG inventory system, CDM has developed its own set of MRVs. Unlike the national inventory process, CDM's primary concern is with validating the emission reductions from a specific project. At the project design phase, a project participant—typically a private emitter and a developing country investor—submit a project design document that gives a general overview of the project and details the methodology being used to calculate an emissions reduction.⁹⁷ The project participant can either propose a new methodology, in which case the CDM Executive Board will review the proposal and verify its approval of the proposed method, or use one of the pre-packaged methods laid out in a CDM Methodology Booklet created by the secretariat and approved by the Executive Board.⁹⁸ The monitoring and verification process is actually delegated to an accredited third-party designated operational entity, such as Det Norske Veritas (DNV), one of the largest providers of validation and certification services for CDM projects.⁹⁹ In a typical project, an emitter would contact DNV to develop and implement a project design document that complies with the CDM's methodologies. DNV would then work with its client to ensure that the project was designed to properly monitor and verify any emissions reductions. DNV would then certify that the project participant had followed the plan.¹⁰⁰ The CDM's secretariat and the Executive Board would then vet the project and register the reductions as CERs unless at least three of the CDM's board members request a review.¹⁰¹

97. See CLEAN DEV. MECHANISM EXEC. BD., GUIDELINES FOR COMPLETING THE PROJECT DESIGN DOCUMENT (CDM-PDD) AND THE PROPOSED NEW BASELINE AND MONITORING METHODOLOGIES (2008).

98. See United Nations Framework Convention on Climate Change, CDM Methodology Booklet (May 2012), <http://cdm.unfccc.int/methodologies/documentation/methbooklet.pdf> [hereinafter CDM Methodology Booklet].

99. *Carbon Offset Validation & Verification*, DET NORSKE VERITAS, http://www.dnvusa.com/services/verification/carbon_credit_validation_verification/index.asp (last visited Aug. 22, 2012).

100. DET NORSKE VERITAS, CLIMATE CHANGE SERVICES (2012), available at http://www.dnvusa.com/focus/climate_change.

101. United Nations Framework Convention on Climate Change, Nov. 28-Dec. 10, 2005, *Report of the Conference of the Parties serving as the meeting of the*

The JI process is similar, but substantially less developed. A JI project also delegates MRV to an accredited third party certified by the JI Supervisory Committee.¹⁰² To initiate a project, the parties must provide a project design document setting forth the proposed emission reduction and an “appropriate baseline and monitoring plan” in accordance with the JI’s criteria.¹⁰³ The accredited third party is responsible for monitoring and verifying that the emissions reductions were actually achieved, which, according to the criteria, involve “the collection and archiving of all relevant data necessary for estimating or measuring anthropogenic emissions by sources and/or anthropogenic removals by sinks of greenhouse gases occurring within the project boundary during the crediting period.”¹⁰⁴ Since the CDM has processed far more projects, it has developed a more thorough set of methodologies for calculating emissions reductions. To the degree feasible, the JI Supervisory Committee applies the CDM’s methodologies to evaluate a JI project design document.¹⁰⁵ This means that for both Kyoto mechanisms, third-party entities are the key component in ensuring that proper MRV procedures are followed.

C. Problems with the Kyoto Process

In many respects, the Kyoto process is an ideal framework for facilitating international carbon trading. It has well-developed technical specifications for preparing annual GHG inventories from Annex I countries, the CDM and JI, although limited in scope, have successfully approved projects that on paper limit GHG emissions, and the institutional framework includes a rigorous review and enforcement procedure. For example, in November 2001, the conference of the parties adopted

Parties to the Kyoto Protocol on its first session, ¶ 35, U.N. Doc. FCCC/KP/CMP/2005/8/Add.1 (Mar. 30, 2006).

102. United Nations Framework Convention on Climate Change, Nov. 28-Dec. 10, 2005, *Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, Guidelines for the implementation of Article 6 of the Kyoto Protocol*, U.N. Doc. FCCC/KP/CMP/2005/8/Add.2 (Mar. 30, 2006) [hereinafter *UNFCCC Guidelines for the implementation of Article 6*].

103. *Id.* at 8.

104. *Id.* at 12.

105. See JOINT IMPLEMENTATION SUPERVISORY COMM., GUIDANCE ON CRITERIA FOR BASELINE SETTING AND MONITORING (Sept. 14, 2011).

the Marrakesh Accords, which established a Compliance Committee that includes two branches.¹⁰⁶ The Facilitative Branch provides (1) advice and assistance, (2) facilitates financial and technical assistance, and (3) formulates recommendations to achieve compliance.¹⁰⁷ The Enforcement Branch can declare a party in noncompliance with the Protocol's monitoring and reporting requirements, its eligibility tests for participation in the flexibility mechanism, or its emissions targets.¹⁰⁸ A question of implementation can be brought before either branch by a party or through an ERT. If a noncompliance declaration is made, the Enforcement Branch can impose sanctions, including suspension from participation in the flexibility mechanisms, requiring the preparation of an action plan to achieve compliance, and a deduction of its emissions allowance during a subsequent commitment period.¹⁰⁹ When put in perspective, Kyoto's compliance procedures are, on paper, equal to or better than other multilateral environmental agreements.

Unfortunately, the Kyoto Protocol suffers from a far more fatal flaw. Although technical discussions have proceeded along an upward trajectory, the parties lack the political will to impose tougher commitments without greater participation from non-Annex I countries, especially the BRICs. Certain Annex I members, plus the United States, insist that a new commitment period include participation from non-Annex I countries. Proposals include requiring non-Annex I countries to submit national adaptation or mitigation plans that would be reviewed in a manner similar to the annual GHG inventory reports.¹¹⁰ Since the Kyoto Protocol's first five-year commitment period is scheduled to end in 2012, parties have been attempting since Copenhagen to reach an agreement on a second commitment period. Durban presented the final, scheduled opportunity to reach a conclusion, after which the treaty's legal form would lapse.¹¹¹ Although negotiators reached a last-minute settlement

106. See *UNFCCC Guidelines for the implementation of Article 6*, *supra* note 102, at 93.

107. *Id.* at 94-95, 101.

108. *Id.* at 95-96.

109. *Id.* at 96, 102.

110. Interview with Climate Change Negotiators (Fall 2011).

111. See Torney & Fujiwara, *supra* note 63.

that extended the treaty's legal form to a second commitment period lasting until either 2017 or 2020, the Durban COP also established a second working group charged with developing an alternative to the Kyoto commitments after 2020, presumably one that would include non-Annex I commitments.¹¹² For long-time observers of the Kyoto negotiations, these agreements appear to be stalling for time. Without a commitment from the United States to join the Kyoto Protocol, the political future of the Kyoto process appears uncertain.

It is the political uncertainty of the international regulatory environment that makes it an ineffective approach to creating linkages between carbon trading markets that are developing nationally or regionally. Investing in international carbon trading requires a commitment of substantial financial resources. Financial and consulting firms, brokers, and other market traders need transparency and stability. There is very little incentive to invest if market participants are constantly worried that the Kyoto Protocol's emission trading system is about to collapse. In addition, any decision to include non-Annex I countries could significantly impact the allocation of existing AAs, which increases the risk that a carbon transaction would fail. Carbon transactions across international markets, which are primarily in the form of ERUs and CERs, are considered high-risk investments because of the uncertainty surrounding the recognition of those credits in established carbon trading markets. That uncertainty is unlikely to decline now that parties to the Kyoto Protocol have endorsed new negotiations under the auspices of the Durban Enhanced Action Plan.

In the long-run, some form of international, intergovernmental regulation of carbon trading will be required. Unfortunately, there is no guarantee when that regulation will be widely adopted or that it will look like the Kyoto mechanisms. There is simply too much uncertainty in the political process to guarantee the level of coordination necessary to make a complex, interdependent emissions trading system like the Kyoto mechanism successful. What is more likely is that the CDM and

112. United Nations Framework Convention on Climate Change, Nov. 28-Dec. 11, 2011, Durban, S. Afr., *Conference of the Parties, Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action*, 2, U.N. Doc. FCCC/CP/2011/9/Add.1 (Mar. 15, 2012).

the JI, which are both supported by a broad coalition of Annex I and non-Annex I parties, will continue to operate, producing tradable emissions credits that are transferrable with emissions credits distributed by national authorities. The trading in offsets will likely be the only international trading that will occur through the Kyoto mechanism. Instead, it is far more probable that international trading will take place through bilateral or multilateral agreements between different trading schemes. The next section will discuss how to facilitate greater trading through the harmonization and mutual recognition of MRV procedures among national trading schemes.

V. COMPARISON OF NATIONAL MRV PROCEDURES

A. European Union Emissions Trading Scheme

The EU's ETS was the first carbon trading market to be implemented by a regional authority. Although it was developed in response to the Kyoto Protocol, the EU's ETS actually preceded the ratification of the Kyoto Protocol by more than a month. Launched in January 2005, the Kyoto Protocol would finally be ratified on February 16, 2005. As a consequence, the ETS was not originally intended to incorporate the various flexible mechanisms of the Protocol (CDM, JI, and AAU trading).¹¹³ Within the EU, the United Kingdom and Denmark were considered the leaders in market-based emissions trading. Denmark had established a pilot program for electricity generators that ran from 2001 to 2003, but the UK Emissions Trading Scheme was the first multi-industry market, and became a model program for the Europe-wide initiative.¹¹⁴

The system employs a complex set of overlapping regulatory bodies at the regional and national level. Each EU member state government is given a national emission cap that matches its Member State National Allocation Plan (NAP).¹¹⁵ The NAP is based on the country's UNFCCC Annex I-defined binding

113. See Frank J. Convery, *Origins and Development of the EU ETS*, 43 ENVTL. & RES. ECON. 391, 395-96 (2009).

114. *Id.* at 391.

115. Council Directive 2003/87, art. 9, 2003 O.J. (L 275) 32, 35-36 (EC).

commitments negotiated as part of the Kyoto Protocol. The EU Commission approves each NAP and national emission cap to ensure that they meet the requirements of the EU's Emission Trading Directive.¹¹⁶ The NAP is based on the percentage of CO₂ emissions in the EU that is estimated to be released by emitters covered under the ETS. Since this includes less than half of the total emissions produced in the Euro-area, member state governments are also obligated to make reductions in emissions from non-covered sectors such as transportation.¹¹⁷ In practice, little effort has been made on directly regulating these sources, with the exception of aviation, which was brought into the EU ETS scheme in 2008.¹¹⁸

Since the ETS was based on smaller, less complicated national models, the Commission decided to implement the program in stages. Phase I (2005-2007) included a small number of industrial sectors that accounted for a significant portion of industrial CO₂ emissions.¹¹⁹ Roughly 11,500 installations related to primary-source energy production, certain industrial producers, and the pulp and paper industry were originally included.¹²⁰ Permits were distributed based on the policies of each member state government, and during Phase I most of the initial permits were provided free of charge, rather than auctioned as is typical for mature pollution trading systems.¹²¹ Phase II, implemented in 2008 and scheduled to last until 2012, made several important changes. First, the Commission passed its "Linking Directive," which established a linkage with the Kyoto Protocol's flexible mechanisms.¹²² Emitters were allowed to exchange a certain number of Kyoto Protocol units from CDM or JI projects for EU ETS credits.¹²³ Second, the Commission agreed to incorporate emissions from aviation activities in the Euro-area by 2012.¹²⁴ Finally, a significant effort was made to

116. *Id.* at art. 9a.

117. *Id.*

118. *Id.* at ch. II.

119. *See* Betz & Sato, *supra* note 56, at 355.

120. *See* Convery, *supra* note 113, at 407.

121. *See* Council Directive 2003/87, art. 11, 2003 O.J. (L 275) 32, 36 (EC).

122. Council Directive 2004/101, 2004 O.J. (L 338) 18 (EC) (amending Council Directive 2003/87/EC).

123. *Id.*

124. *See* Council Directive 2003/87, art. 11a, 2003 O.J. (L 275) 32 (EC).

increase member state compliance with Council Directives, in particular, to improve the detail of member-state submitted NAPs.

i. Monitoring

The EU Commission established the most recent regulations for monitoring and reporting GHG emissions on June 21, 2012, replacing a 2007 Decision with a more comprehensive set of technical guidelines.¹²⁵ The Regulation requires that all GHG monitoring and reporting “be complete and cover all process and combustion emissions from all emission sources and source streams belonging to activities” specified in the technical appendix and covered under Council Directive 2003/87/EC.¹²⁶ For stationary sources, this includes accounting for any “abnormal events including start-up and shutdown and emergency situations over the reporting period”¹²⁷

The operator of an installation is given the choice to use a calculation-based methodology or a measurement-based methodology.¹²⁸ If the operator adopts a calculation-based method, it must select the methodology required under Annex IV for its particular industry or “provide[] evidence to the competent authorities that the use of such methodology is technically not feasible or incurs unreasonable costs, or that another methodology leads to a higher overall accuracy of emissions data.”¹²⁹ The Regulations allow the operator to combine different monitoring methods at a single installation provided that no double accounting occurs.¹³⁰ At the start of each reporting period, the operator is required to submit to its national regulatory authority a detailed monitoring plan setting forth the type of emissions being measured, the methodology used, and a variety of other details about the emission stream.¹³¹ Any changes to the

125. Commission Regulation 601/2012, art. 30, 2012 O.J. (L 181) 30 (EC).

126. *Id.* at art. 5.

127. *Id.* at art. 20.

128. *Id.* at art. 21.

129. *Id.*

130. *Id.*

131. Commission Regulation 601/2012, art. 11, 2012 O.J. (L 181) 30 (EC).

operation of the facility that would affect the monitoring plan's accuracy must be reported to the national regulatory authority.¹³²

The calculation-based approach applies a simple formula: CO₂ emissions = activity data X emission factor X oxidation factor.¹³³ For combustion emissions, activity data is the fuel flow expressed in terms of energy content.¹³⁴ For process emissions, activity data is the material consumption, throughput or production output, which is also expressed in terms of energy content.¹³⁵ A conversion factor is applied to address any input materials that were not converted to CO₂ during the production process.¹³⁶ The EU ETS attempts to minimize the reporting requirements for smaller emitters by creating a tier-based approach to calculating an installation's emissions. Smaller installations are permitted to use less accurate calculations, and any installation may seek an exemption from the minimum requirement if they can show that such calculations are technically infeasible or likely to lead to unreasonably high costs.¹³⁷ The Regulation clearly favors direct measurement of activity data. However, if an operator can prove that direct measurement is technically infeasible or would lead to unreasonably high costs, it can either estimate using data from previous years or supply audited financial documents containing documented methods that produced data on material use during the reporting period.¹³⁸ The measurement-based approach, which employs a CEM system, requires operators to use CEN standards issued by the European Committee for Standardization.¹³⁹ If CEN standards are unavailable, the operator should look to ISO standards or relevant national standards.¹⁴⁰ Operators are required to provide hourly averages.¹⁴¹

132. *Id.* at art. 14.

133. *Id.* at art. 24.

134. *Id.*

135. *Id.* at art. 25.

136. *Id.*

137. Commission Regulation 601/2012, art. 26, 2012 O.J. (L 181) 30 (EC).

138. *Id.* at art. 27.

139. *Id.* at art. 42.

140. *Id.*

141. *Id.* at art. 43.

ii. Reporting

The Commission requires installation operators to file annual reports that include the calculations and other assumptions used during the monitoring process.¹⁴² These reports are submitted to the operator's national regulatory authority before submission to the Commission.¹⁴³ For the most part, the reporting requirements simply ask the operator to show its work by including all sources, calculations, measurement methodologies, uncertainties, and other assumptions used to arrive at the total emissions calculation.¹⁴⁴ Emissions from different source streams at a single installation that belong to the same type of activity can be aggregated by the operator.¹⁴⁵ For example, a refinery with multiple smokestacks emitting CO₂ can aggregate its emissions from each source in the final report. Each report must be labeled using both the Common Reporting Format of the UNFCCC's GHG inventory system and the Integrated Pollution Prevention and Control code contained in Annex I of Regulation 166/2006.¹⁴⁶ The IPPC codes were developed as part of Directive 2008/1/EC, which established an integrated method for monitoring and reporting industrial pollutants in the European Community.¹⁴⁷ The practical effect of these requirements is to make reporting relatively standardized. ETS emissions can be compared directly with emissions from other Kyoto-compliant carbon-trading markets, potentially improving the transparency of the trade. In addition, ETS reporting is not duplicative of IPPC reporting, potentially reducing the regulatory burden.

The Commission also requires rigorous record-keeping. Operators are required to keep records sufficient to allow for the verification of its annual emissions report, but also to maintain an archive of data, including detailed information on the calculations used in its measurement methodology, for up to ten years.¹⁴⁸ To ensure that operators are complying, the

142. *Id.* at art. 67.

143. Commission Regulation 601/2012, art. 67, 2012 O.J. (L 181) 30 (EC).

144. *Id.* at art. 7.

145. *Id.* at art. 19.

146. *Id.* at art. 73.

147. *See* Council Directive 2008/1, 2008 O.J. (L 24) 8, 19 (EC).

148. Commission Regulation 601/2012, art. 66, 2012 O.J. (L 181) 30 (EC).

Commission also requires the establishment of a control system that ensures that “the annual emissions report . . . resulting from the data flow activities does not contain misstatements and is in conformity with the monitoring plan and [the Commission’s] Regulation.”¹⁴⁹ An approved control system must include “an operator’s or aircraft operator’s assessment of inherent risks and control risks” and “written procedures related to control activities that are to mitigate the risks identified.”¹⁵⁰ Those written procedures must at least include the following elements:

- (a) quality assurance of the measurement equipment;
- (b) quality assurance of the information technology system used for data flow activities, including process control computer technology;
- (c) segregation of duties in the data flow activities and control activities as well as management of necessary competencies;
- (d) internal reviews and validation of data;
- (e) corrections and corrective action;
- (f) control of out-sourced processes;
- (g) keeping records and documentation including the management of document versions.¹⁵¹

The operator is required to periodically evaluate and improve its control system through internal audits.¹⁵² At the operator’s discretion, the control system may reference procedures or documents contained in other management systems, including the EU Eco-Management and Audit Scheme (EMAS), ISO 14001:2004 (environmental management systems), ISO 9001:2000 (general management systems), and financial control systems.¹⁵³ For quality assurance procedures applied to continuous emission measurement systems, operators are required to follow EN 14181, Quality Assurance of Automated Measuring Systems.¹⁵⁴

149. *Id.* at art. 58.

150. *Id.*

151. *Id.*

152. *Id.*

153. These systems were directly referenced in the Commissions 2007 Decision, but in the 2012 Regulations the language reads “measurement standards traceable to international measurement standards . . .” *Id.* at art. 59. It is unclear whether this allows the operator to select from a wider set of international standards.

154. *Id.*

iii. Verification

Since the EU is a multi-level governance structure that incorporates a variety of different national regulatory schemes, verification is particularly difficult. The first step in the verification process is at the national level. The national regulatory authority is the institution that reviews the emissions reports of operators within their national jurisdiction.¹⁵⁵ Since each regulatory authority has its own unique capabilities and existing domestic regulations, the Commission's initial approach was to set forth a general set of principles to guide verifiers through the process.¹⁵⁶ With the promulgation of Phase III regulations, the Commission adopted a separate set of regulations for verification that dramatically increase the requirements for verification, accreditation of third-party verifiers, and standards for accrediting bodies in the member states.¹⁵⁷

The initial step is to assess each annual emissions report using a strategic and risk analysis. The strategic analysis involves (1) determining whether the annual emissions report has been properly approved by the competent national regulatory authority, (2) whether the verifier can understand each activity undertaken at the installation, and (3) understand the monitoring plan and control system.¹⁵⁸ Once a strategic analysis is complete, the verifier must (1) assess the risk of misstatement or omission given the complexity and scope of the operator's emissions, and (2) develop a verification plan, including a description of the activities at the installation and the data sampling necessary to verify those activities.¹⁵⁹

Once a verification plan is in place, the verifier must determine what actions must be taken to carry out that plan. This may include a site visit to visually inspect measurement technology or control systems, conduct interviews, or collect other necessary evidence.¹⁶⁰ If a site visit is not required, the verifier

155. Council Directive 2003/87, art. 15, 2003 O.J. (L 275) 32 (EC) ("Member States shall ensure that the reports submitted by operators pursuant to Article 14(3) are verified in accordance with the criteria set out in Annex V . . .").

156. Commission Decision 2007/589, 2007 O.J. (L 229) 1, 30-33 (EC).

157. See Commission Regulation 600/2012, 2012 O.J. (L 181) 1 (EC).

158. *Id.* at art. 11.

159. *Id.* at arts. 12-13.

160. *Id.* at arts. 14, 16, 21.

must still carry out the verification plan by collecting enough data using the defined sampling methods to determine whether the operator's annual emissions report is accurate.¹⁶¹ If the report is missing data, or the verifier identifies noncompliance with the installation's monitoring plan, the verifier must ensure that the operator is informed of its misstatements or omissions, and correct them before verification is complete.¹⁶² The verifier must then produce an internal verification report demonstrating that the verification plan has been implemented.¹⁶³ The 2012 Regulations have added an additional layer of oversight, requiring that a third-party verifier submit its internal verification report to an independent reviewer.¹⁶⁴ The independent reviewer, which was not involved in the verification process, must then determine whether the third-party verifier complied with the Commission's Regulations when it conducted its verification activities.¹⁶⁵ After completing the verification plan, the verifier produces a final report, an opinion regarding compliance, and documentation showing its methodology to the operator.¹⁶⁶ An operator is then required to submit the verification report, along with his annual emissions report, to the competent national regulatory authority.¹⁶⁷

It is important to note that a third-party verifier may be either a competent national authority or a non-governmental private party. The EU's regulations require that all verifiers:

- 1) Maintain a competence process, which requires documentation that the verifiers are trained, properly supervised, and subject to periodic internal reviews.¹⁶⁸
- 2) Assemble a verification team with clearly delineated responsibilities and the competence necessary to assess the scientific and technical details of the installation's processes and procedures.¹⁶⁹

161. *Id.* at arts. 18-20.

162. *Id.* at art. 22.

163. Commission Regulation 600/2012, art. 16, 2012 O.J. (L 181) 1 (EC).

164. *Id.* at art. 25.

165. *Id.*

166. *Id.* at art. 27.

167. *Id.* at art. 74.

168. *Id.* at art. 35.

169. Commission Regulation 600/2012, art. 36, 2012 O.J. (L 181) 1 (EC).

- 3) Keep clear documentation of verification procedures and records of verification activities.¹⁷⁰
- 4) Ensure that the verifier is impartial and independent of the operator, is organized in such a way as to maintain its impartiality and independence, and meets the conflict of interest requirements found in Article 42, paragraphs 4 and 5.¹⁷¹

Verifiers must also be accredited by a national accreditation body established by the operator's national authority pursuant to Article 5(1) of Commission Regulation 765/2008.¹⁷² If a private third-party verifier seeks accreditation, it must provide all information requested by the national accreditation body, in particular the verifier's competence process, how it plans to maintain continuous impartiality and independence, its technical expertise, and the verifier's record-keeping procedures.¹⁷³

Private third-party auditors play an important role in the EU ETS system. They function as the first line of defense against mistakes or omissions in the monitoring plans and annual emission reports of EU operators. For example, VerifAvia is an accredited verification service for the EU's aviation sector.¹⁷⁴ The company offers aviation-sector clients a general service aimed at auditing and improving the control systems described above, as well as a verification service intended to ensure compliance with EU regulations.¹⁷⁵ The scope of a private auditor's services depends on the needs of a client. Some national governments will have substantial environmental regulations already in place that require operators to implement certain monitoring technologies. Other governments may have very little regulation, requiring a third-party verifier to work closely with an operator to ensure the implementation of proper monitoring and reporting techniques.

170. *Id.* at arts. 40-41.

171. *Id.* at art. 42.

172. *Id.* at art. 45.

173. *Id.*

174. See VERIFAVIA, <http://www.verifavia.com/en/index.php> (last visited Sept. 30, 2012).

175. *Id.*

B. New Zealand Emissions Trading Scheme

On September 25, 2008, New Zealand's parliament passed The Climate Change Response Amendment Act 2008 (Amendment Act), establishing a wide-ranging emissions trading scheme second only in scope to the EU's ETS.¹⁷⁶ The Amendment Act will regulate the emissions of all six main GHGs listed in Annex A of the Kyoto Protocol.¹⁷⁷ The scope of the eventual regulations may be even broader than the ETS, encompassing forestry, transportation, primary energy generators, industrial facilities, agriculture, and waste.¹⁷⁸ Agriculture and forestry are particularly difficult sectors to regulate effectively. In the case of large agricultural producers, the primary GHGs are CH₄ and N₂O. CH₄ is released as a byproduct of animal waste, and at a technical level, estimating CH₄ emissions based on the size of animal herds is actually far easier than achieving accurate measurements of smokestack emissions.¹⁷⁹ N₂O emissions occur largely through the use of fertilizers, and measuring this type of emission will likely depend on self-reporting and the occasional audit. What is surprising about New Zealand's program is that agricultural producers are an especially influential political constituent, making regulations politically costly to impose.¹⁸⁰

Like the EU, New Zealand's trading scheme also imposes its emission reduction targets at producers or importers who are sufficiently high in the supply chain. After its first year of operation, New Zealand's ETS has ninety-six mandatory participants, primarily in the coal and natural gas sectors.¹⁸¹ By placing the point of obligation upstream, MRV procedures are

176. Climate Change Response (Emissions Trading) Amendment Act 2008 (N.Z.).

177. This includes CO₂, CH₄, N₂O, hydrofluorocarbons (HFCs), PFCs, and sulphur hexafluoride.

178. See Climate Change Response (Emissions Trading) Amendment Act 2008, Third Schedule (N.Z.).

179. See Philip Robertson et al., *Greenhouse Gases in Intensive Agriculture: Contributions of Individual Gases to the Radiative Forcing of the Atmosphere*, 289 Sci. 1922 (2000).

180. Within the EU, this is even more difficult given the prominent role played by the EU's Common Agricultural Policy. See David Bullock, *Emissions Trading in New Zealand: Development, Challenges, and Design*, 21 ENVTL. POL. 657 (2012).

181. N.Z. EMISSIONS TRADING SCHEME, *supra* note 46, at 7.

more cost-effective. However, it risks insulating consumers from the price changes associated with emissions reductions.¹⁸² It also risks making the emissions trading market substantially less liquid. There will be fewer trades, and fewer tradable credits, than if the market involved smaller emitters, making it more susceptible to market manipulation. However, this is partially offset by New Zealand's decision to comprehensively cover all major industrial sectors.

Another special variation of the New Zealand scheme is that its cap is set in reference to New Zealand's AAUs allocated through the Kyoto Protocol's legally binding commitments.¹⁸³ This allows the government to issue New Zealand Units (NZUs) that are directly based on the total allowable CO₂ equivalent tons of greenhouse emissions provided under the country's Annex I commitment, and allows the emitter to import energy units from Kyoto-approved mechanisms, such as the CDM or JI projects. Unlike the EU ETS, which has received substantial criticism from developing countries for walling off CDM or JI projects from access to its market, New Zealand's ETS will provide complete compatibility with Kyoto-based market mechanisms.¹⁸⁴ A JI project formed with an Indonesian industrial producer that receives certification for a particular amount of EMUs could be imported to New Zealand to provide an equal number of NZUs. Unfortunately, since New Zealand is the only major ETS to create complete compatibility, it does not necessarily mean that the ETS will be easier to link with other carbon markets. An emitter seeking to export EMUs from within the Eurozone will still have to conform to the EU's ETS regulations.

The obvious downside for New Zealand emitters is that once the program is fully up and running (estimated to be sometime before the end of 2013), they will have to deal with a cap on total emissions that is equal to the legally binding commitments contained in Annex I of the Kyoto Protocol. The EU ETS was established to insulate European producers from the full

182. Robbie Andrew & Vicky Forgie, *A three-perspective view of greenhouse gas emission responsibilities in New Zealand*, 68 *ECOLOGICAL ECON.* 194 (2008).

183. Climate Change Response Act 2002, pt. 4, cl 68, 69(2) (N.Z.) [hereinafter C.C. Response Act].

184. Nan Jiang et al., *New Zealand's Emissions Trading Scheme*, 43 *N.Z. ECON. PAPERS* 69 (2009).

consequences of the Kyoto commitments until the Protocol became fully implemented by every Annex I member state.¹⁸⁵ The EU had no intention of creating a trading scheme that would let its domestic producers suffer relative to its strategic economic competitors. There has been some suggestion that the New Zealand government, through the purchase of CERs or AAUs, might lower the initial risk to New Zealand producers. The government would purchase CERs or AAUs using the Kyoto trading system, which would reduce the overall cap on industry that would be required to meet New Zealand's Kyoto commitments.¹⁸⁶ However, to successfully use this strategy New Zealand will have to establish standards and procedures for linking its market to other ETS systems, especially given the differing standards for assessing inter-market trading in the EU ETS.

i. Monitoring and Reporting

Since the New Zealand ETS is being implemented on a sector-by-sector basis, this Comment focuses on the sectors that, under current law, are obligated to report emissions. This includes forestry, stationary energy sources, industrial processes, and liquid fossil fuels.¹⁸⁷ Unlike the EU ETS, which has a standard monitoring and reporting framework for each sector, the New Zealand ETS provides separate regulations applicable to each. To the degree possible, sector requirements will be presented side-by-side. For stationary energy sources and industrial processes, the ETS primarily requires calculation-based methodology similar to the EU ETS model.¹⁸⁸ For example, a coal-fired power plant is required to account for imported coal using a formula that incorporates the total amount of coal (imports minus exports), the energy content, any adjustment from stockpiling, and any unique emissions factors.¹⁸⁹ Different formulas are required for mined coal or for any coal

185. Convery, *supra* note 113, at 399.

186. Bullock, *supra* note 180, at 671.

187. See Climate Change Response Act 2002, Third Schedule, cl 1-6 (N.Z.).

188. See, e.g., Climate Change (Stationary Energy and Industrial Processes) Regulations 2009, SR 2009/285, reg 35 (N.Z.) (calculation method for producers of aluminum) [hereinafter Energy and Indus. Regs.].

189. *Id.* at reg 8.

converted to gas using a UCG operation.¹⁹⁰ Similar formulas are required for natural gas, geothermal fluid, municipal waste or waste oil, and petroleum refining. For certain measurements, participants are required to employ continuous monitoring technologies.¹⁹¹ To measure mined natural gas emissions, the operator is required, where possible, to sample every thirty minutes, or else at least at intervals of not longer than three months. The samples must then be tested by a government laboratory or an accredited laboratory complying with ISO 17025:2005.¹⁹² CEM may also be used by an operator combusting oil, waste oil, used tires, or municipal waste.¹⁹³

Measurement of industrial processes occurs solely through calculation-based methods. Each industrial sector is divided into a category based on either the material used or the type of gas emitted, such as perfluorocarbons or aluminum smelting. The emitter is responsible for collecting activity-based information and properly applying the factors listed.¹⁹⁴ For liquid fossil fuel users, the ETS requires an accounting of the type and volume of fuel removed for either home, industrial, or transportation consumption.¹⁹⁵ The regulations exempt users who employ an amount of fuel below a threshold set by Regulation 5, which means only heavy users of liquid fuels will be required to monitor and report.¹⁹⁶ To calculate total emissions, the user must provide the amount of fuel used and any unique emissions factors.¹⁹⁷ One feature of New Zealand's regulations is the attempt to address potential leakages by including so-called "opt-in participants." These are entities otherwise not regulated who purchase more than a specified amount of either coal or natural gas.¹⁹⁸ This feature prevents circumventing reporting requirements by purchasing arrangements through third-parties.

190. *Id.* at reg 11(1).

191. *E.g., id.* at reg 16(3).

192. *Id.*

193. *Id.* at reg 24.

194. *E.g.,* Energy and Indus. Regs., *supra* note 188, at reg 34 (aluminum producers).

195. Climate Change (Liquid Fossil Fuels) Regulations 2008, SR 2008/356, reg 5 (N.Z.) [hereinafter Fossil Fuels Regs.].

196. *Id.*

197. Energy and Indus. Regs., *supra* note 188, at reg 44(G).

198. *Id.* at regs 45, 48.

Each participant is required to submit an annual emission return that contains (1) a record of the participant's activities, (2) the measurement methodology employed and any corresponding calculations, (3) an assessment of the participant's liability to surrender NZUs based on the annual emissions, and (4) any additional requirements contained in the Ministry of Economic Development's (MED) regulations.¹⁹⁹ Participants are required to maintain records that allow the MED to verify emissions reductions. These include sales receipts or invoices, customs documentation, supplier contracts or agreements, or any other document produced during the monitoring process, such as lab reports or internal audits.²⁰⁰ Like the EU ETS, participants are required to maintain some type of internal quality control process.²⁰¹ One distinctive aspect of the New Zealand system is that participants can seek to apply a unique emissions factor by applying to the MED. The participant must prove that the unique emissions factor differs substantially from the generic factor for that type of fuel.²⁰² It must then undergo an "activity-specific prescribed sampling and testing regime" and be verified by a recognized verifier.²⁰³ This is a key component of New Zealand's ETS because third-party verification of emissions reports is only required if the participant has applied for and received permission to use a unique emissions factor.

Under the New Zealand Emission Trading Scheme (ETS), each participant receives a limited number of NZU, which are distributed in proportion to each industry's contribution to New Zealand's Annex I Kyoto Protocol target.²⁰⁴ One NZU is equal to one ton of CO₂ equivalent greenhouse gas, and is designed to be directly transferrable with the Kyoto Protocol's trading units. A unique aspect of New Zealand's ETS is the participation of the forestry sector. The owner of any forested area larger than one

199. C.C. Response Act, *supra* note 183, at pt. 4, cl 65.

200. NEW ZEALAND MINISTRY FOR THE ENV'T, REPORTING GUIDANCE FOR THE STATIONARY ENERGY AND INDUSTRIAL PROCESSES AND LIQUID FOSSIL FUELS SECTORS UNDER THE NEW ZEALAND EMISSIONS TRADING SCHEME 4 (2009) [hereinafter N.Z. REPORTING GUIDANCE].

201. *Id.* at 7.

202. Climate Change (Unique Emissions Factors) Regulations 2009, SR 2009/286, reg 4(2)(b)(i) (N.Z.) [hereinafter Unique Emissions Regs.].

203. *Id.* at reg 4.

204. C.C. Response Act, *supra* note 183, at pt. 4, cl 68.

hectare can participate as long as each hectare has more than 30% tree crown cover.²⁰⁵ Forestry participants are divided between owners of land forested prior to December 31, 1989 and owners of land with forested areas established after that date.²⁰⁶ Since the legislation is primarily intended to prevent deforestation, participation by pre-1990 land owners is mandatory if the landowner deforests more than two acres during the ETS's five-year commitment period.²⁰⁷ Post-1990 land owners can volunteer to participate in order to receive credit for reforestation projects.²⁰⁸

For pre-1990 owners, the ETS allocates a specific number of NZUs based on the total forested area as of January 1, 2008.²⁰⁹ For land that has not changed ownership arrangements since October 31, 2002, the owner will be allocated sixty NZUs.²¹⁰ Owners that received the forested area by transfer after that date will be allocated thirty-nine NZUs.²¹¹ The owner of any land held under New Zealand's Crown forest license that was or will be transferred to a New Zealand indigenous group under a treaty of settlement will receive eighteen NZUs.²¹² The ETS exempts pre-1990 owners from submitting annual monitoring reports, but does impose a reporting requirement for any deforestation.²¹³ The pre-1990s owner must establish evidence of ownership, provide a geospatial map of the area, and be capable of providing aerial photos, planting records, or tree ages if there is any doubt from the records that the area was forested before 1990.²¹⁴

Post-1990 owners of forested lands are not required to participate in the ETS, but can receive NZUs for any measurable increase in forested area on their property since 1990.²¹⁵ To

205. *Id.* at pt. 5, cl 179(1)(b).

206. *Id.* at pt. 5, cl 180(1).

207. Climate Change Response Act 2002, Third Schedule, pt. 1 (N.Z.).

208. C.C. Response Act, *supra* note 183, at pt. 5, cl 187.

209. *Id.* at, pt. 4, cl 72(2)(b) (N.Z.).

210. NEW ZEALAND MINISTRY OF AGRIC. & FORESTRY, A GUIDE TO THE PRE-1990 FORESTRY ALLOCATION AND EXEMPTIONS 5 (2010).

211. *Id.*

212. *Id.* at 6.

213. Climate Change (Forestry Sector) Regulations 2008, SR 2008/355, reg 17 (N.Z.).

214. NEW ZEALAND MINISTRY OF AGRIC. & FORESTRY, *supra* note 210, at 10.

215. C.C. Response Act, *supra* note 183, at pt. 5, cl 188.

qualify, applicants are required to create an electronic map and assign certain areas of the map as carbon accounting areas (CAAs).²¹⁶ The participant then submits periodic emissions returns to the Ministry of Agriculture and Forestry (MAF) to show increases of the forested areas contained in their CAA.²¹⁷ Voluntary returns can be submitted as often as the participant desires, but a mandatory return is required at the end of the five-year commitment period.²¹⁸ The MAF provides detailed instructions on calculating the increase in a forested area based on the geospatial mapping submitted by the participant.²¹⁹ Once MAF determines the appropriate growth in the CAA's carbon stock, the ministry releases the NZUs to the participants' trading account.

ii. Verification

Since the New Zealand ETS is not a supranational authority, its ETS regulations apply more typical command and control verification procedures. Section 94 grants an authorized agent of the Environmental Protection Authority (N.Z. EPA) the ability to request "information that is reasonably necessary" to ascertain whether a person is in compliance all relevant regulations.²²⁰ This power is supplemented with the authority to require an in-person appearance before an appointed agent and the production of documents in the person's possession.²²¹ An appointed agent may also enter any land or premises at any reasonable time during normal business hours to conduct an investigation into whether the person is in compliance with the monitoring and reporting requirements of the ETS.²²² When necessary, the N.Z. EPA can request a judicial inquiry before a district court judge.²²³ Sections 129 through 143 establish penalties for non-compliance,

216. Climate Change (Forestry Sector) Regulations 2008, SR 2008/355, reg 18 (N.Z.).

217. *Id.* at reg 20.

218. C.C. Response Act, *supra* note 183, at pt. 5, cl 189(9).

219. Climate Change (Forestry Sector) Regulations 2008, SR 2008/355, Fifth Schedule (N.Z.).

220. C.C. Response Act, *supra* note 183, at pt. 4, cl 94(1).

221. *Id.* at pt. 4, cl 95(1).

222. *Id.* at pt. 4, cl 100(1).

223. *Id.* at pt. 4, cl 96(1).

evasion, failing to surrender NZU units upon the request of the N.Z. EPA, and failure to submit the required documentation.²²⁴

As mentioned above, only those participants seeking to apply a unique emissions factor are required to achieve third-party verification before submitting an annual emissions report.²²⁵ The N.Z. EPA is authorized by statute to “recognize a person or organisation with the prescribed expertise, technical competence, or qualifications . . .” necessary to undertake verification procedures for the approval of a unique emissions factor.²²⁶ Compared to the EU ETS, this provides a very limited statutory role for a third-party auditor. However, the statute permits any participant to submit verification of an annual emission report by a third-party verifier, and the MED guidebook encourages participants to do so.²²⁷ Once again, private, third-party auditors are stepping into the regulatory space to provide certainty for New Zealand’s ETS participants. Deloitte’s New Zealand office is a recognized third-party verifier and offers to “[v]erify that your emissions return and reporting methodologies comply with the regulations” for clients seeking to minimize the risk of noncompliance.²²⁸ Unlike the EU ETS, the primary responsibility for verification still rests with the N.Z. EPA.

C. Opportunities for Policy Harmonization

Of the three regulatory approaches, the EU and New Zealand have the most closely aligned MRV procedures for the types of industries typically regulated under an emissions trading system. Both rely primarily on calculation-based monitoring procedures, employing a factor analysis that is similar in almost all meaningful respects. Although New Zealand’s verification procedures rely less on third-party verifiers, the statute provides the N.Z. EPA with substantial authority to audit, investigate, and penalize any noncompliance. Since the system is designed to

224. *Id.* at pt. 4, cl 129-43.

225. Unique Emissions Regs., *supra* note 202, at reg 4(2)(d).

226. C.C. Response Act, *supra* note 183, at pt. 4, cl 92(1); *see also id.* at cl 163(1)(e)(ii).

227. N.Z. REPORTING GUIDANCE, *supra* note 200, at 7.

228. *Managing ETS Compliance*, DELOITTE, http://www.deloitte.com/view/en_NZ/nz/services/climate-change-and-sustainability/managing-ets-compliance/index.htm (last visited Apr. 12, 2012).

target consumption at the highest level of the energy supply chain, regulators are only presently enforcing compliance on ninety-six active participants.²²⁹ The vast majority of those participants are sophisticated business enterprises who can reasonably be expected to know how to navigate New Zealand's regulatory requirements. What might present more of a challenge is whether New Zealand's government will be willing to accept the third-party verification procedures of the EU ETS. The sheer size of the regulated market means that the EU Commission and the relevant national regulatory authorities will be required to address a more diverse and potentially less sophisticated set of participants. The Commission itself is limited to reviewing verification determinations from Member States through an awkward consultation process prescribed by Council Directive 2003.²³⁰ If more reports surface of an EU process that lacks the requisite oversight of third-party verifiers, New Zealand regulators may be hesitant to recognize certain EU ETS emissions credits.

Although both markets will eventually make their domestic credits directly transferrable to Kyoto units, the New Zealand ETS's NZUs are transferrable on a one-to-one basis with other Kyoto units.²³¹ This allows New Zealand participants to acquire ERUs or CERs through Kyoto's JI or CDM system and apply them to meeting their domestic allowance.²³² The EU has been less willing to grant ERUs or CERs direct transferability based on concerns that the MRV procedures in place at the CDM Executive Board or the JI Supervisory Committee are insufficient to guarantee real and verifiable emissions reductions. If the EU ends up keeping a separate registry for internal market trading, it will make international carbon trading more difficult. A seller seeking to enter the EU ETS market would have to demonstrate that the credit was either a recognized NZU provided by the N.Z. EPA or a Kyoto unit that meets the requirements of the EU Commission. In addition, because the New Zealand system is designed to adjust its allocation based on the five-year Kyoto commitment period, any revision of the allocation allowances at

229. See discussion *supra* Part II.

230. Council Directive 2003/87, art. 21, 2003 O.J. (L 275) 32, 38 (EC).

231. Bullock, *supra* note 180, at 671.

232. *Id.*

the end of the five-year period could mean retiring certain allowances and adjusting the allowances held by all other participants. This reorganization would make it extremely difficult to allow international brokers to bank tradable credits or engage in futures trading, both of which can improve the efficiency of carbon markets if implemented properly.²³³

The easiest solution to these issues is likely an implementing agreement between the EU ETS and New Zealand ETS that would clarify the transferability of credits. Such an agreement would (1) specify the terms under which credits could be transferred, including an official exchange rate for NZUs and EU ETS emissions credits (assuming that the Commission does not officially link its credits with Kyoto AAUs), (2) the type of market activities permitted, (3) the proper registration procedures tracking credit transfers, and (4) the bilateral recognition of regulatory determinations made in both markets by the relevant market regulatory authorities.²³⁴ Although both countries are actively considering such an agreement, the EU Commission has made it clear that New Zealand's forestry offsets are incompatible with the EU's approach.²³⁵ The offsets encourage so-called carbon arbitrage, whereby credits purchased outside of the EU ETS flood the market, resulting in no net reduction in overall emissions. This problem could be solved through an implementing agreement that either discounts New Zealand credits or specifically identifies and prevents trading NZUs earned through forestry offsets, but such an agreement would be

233. In fact, the EU has examined this problem extensively and concluded that the Kyoto Protocol does not allow banking of AAUs beyond the legally binding commitment period. It has approved the carry-over of certain CERs or ERUs acquired through CDM or JI projects, but only up to a certain percentage of a Member State's NAP. DIRECTORATE GEN. ENV'T & CLIMATE ACTION, EUROPEAN COMM'N, STUDY ON THE INTEGRITY OF THE CLEAN DEVELOPMENT MECHANISM (2011).

234. "Authorities" is plural because the EU's system will inevitably include regulatory decisions made by national regulatory authorities.

235. Brian Fallow, *NZ-Europe ETS link a long way off, says official*, N.Z. HERALD (Mar. 30, 2011), http://www.nzherald.co.nz/economy/news/article.cfm?c_id=34&objectid=10715758.

politically difficult given the importance of the forestry program to New Zealand's government.²³⁶

The effectiveness of the harmonization approach is limited by the political reality that adjusting hard-fought regulations to accommodate market linkage may not be politically feasible. A bilateral agreement between the EU ETS and the New Zealand ETS could feasibly address the real differences in MRV procedures that might prevent carbon trading. However, New Zealand's government is politically committed to a wider ETS, which rewards certain domestic industries with financial benefits in the form of generous carbon offsets. The EU ETS is less capable of increasing market participation to include other political sectors because of the limits of political agreement between EU Member States. Ensuring compliance with EU Commission Directives within the European Community has proven far more difficult than was anticipated by early Commission studies of the problem.²³⁷ In addition, Europol has recently identified the manipulation of carbon trading as a key avenue for organized crime in Europe, citing evidence that the diversity of different regulatory approaches within the European Community contributes to regulatory arbitrage by potential criminals seeking to defraud energy trading markets.²³⁸

VI. **TRANSNATIONAL ENVIRONMENTAL AUDITING STANDARDS**

In an ideal world, the Kyoto Protocol's agreed-upon methodologies and technical definitions would establish standards for each country's carbon trading market. However, in the absence of national commitments to universally adopt and apply Kyoto standards, an alternative can be achieved through transnational coordination of private parties. For example, the International Auditing and Assurance Standards Board (IAASB) develops International Standards on Auditing (ISAs) that are

236. The EU Commission's attitude is a bit disingenuous because the EU ETS already permits ERUs earned through the CDM, which New Zealand's forestry participants could earn by applying to the CDM directly.

237. JON BIRGER SKJÆRSETH & JØRGEN WETTESTAD, *EU EMISSIONS TRADING: INITIATION, DECISION-MAKING AND IMPLEMENTATION* 35, 58 (2008).

238. EUROPOL, *ORGANISED CRIME AND ENERGY SUPPLY: SCENARIOS TO 2020* 6-17 (2010).

widely recognized as the premiere transnational standards in financial auditing.²³⁹ The existence of ISAs on a wide variety of accounting procedures has standardized the international practice of financial accounting, while improving the transparency of firms seeking to attract investors from a diversity of different domestic regulatory structures.²⁴⁰

A similar process would allow investors to develop confidence in the monitoring and verification of emissions reductions represented in either credits or offsets. An EU broker could then have confidence that emissions offsets put together in New Zealand would be based on similar technical standards. An environmental transnational auditing standard could also be flexible enough to incorporate the diversity of different approaches to monitoring, reporting, and verifying carbon emissions that are currently being developed in the various regional markets.²⁴¹ Those countries with the regulatory capacity to establish national standards could work closely with such a standard-setting agency to help develop best practices. Firms in developing countries with little regulatory capacity could use the international standards to increase transparency and encourage partnerships through JIs or projects funded through the CDM. A standards board could also allow the regional trading markets in the United States to coordinate with international markets without an EPA program in place.²⁴²

Such private standards are already commonly employed to certify carbon offsets in privately traded markets. For example, the Verified Carbon Standard (VCS), formerly the Voluntary Carbon Standard, was formed by a consortium of business and environmental leaders to develop greater quality assurance for

239. Robert P. Delonis, *International Financial Standards and Codes: Mandatory Regulation Without Representation*, 36 N.Y.U. J. INT'L L. & POL. 563, 591-93 (2004).

240. Joseph J. Norton, A "New International Financial Architecture?"--*Reflections on the Possible Law-Based Dimension*, 33 INT'L LAW. 891 (1999).

241. See Button, *supra* note 23.

242. See generally Steven Ferrey, *Goblets of Fire: Potential Constitutional Impediments to the Regulation of Global Warming*, 35 ECOLOGY L.Q. 835 (2008) (discussing regional trading market management initiatives in the absence of a federal program).

carbon offsets traded in voluntary carbon markets.²⁴³ The VCS standard is used to evaluate methodologies for measuring reductions in carbon emissions from third-party participants.²⁴⁴ A potential methodology is submitted to the VCS, evaluated and verified by an approved validation/verification body (VVB), and, if the method is used in a project, the verified emissions reductions are registered as Voluntary Carbon Units with a VCS-approved registry.²⁴⁵ Unfortunately, the rigor of the VCS depends on the validation of certain methodologies, which takes place through third-party VVBs.²⁴⁶ VCS is not equipped to independently approve third-party verifiers, so it relies on accreditation received from either a GHG program recognized by the VCS, such as the CDM, JI, or California's Climate Action Reserve, or through accreditation received from a member of the International Accreditation Body under ISO 14065.²⁴⁷

The Gold Standard offers a similar certification, but limits its third-party certification to only those verifiers recognized by an UN-accredited auditor, such as a CDM's DOE.²⁴⁸ Gold Standard certification also involves more procedural certification, including engagement with local stakeholders and a final review by the Gold Standard's own Technical Advisory Committee.²⁴⁹ The Gold Standard also limits the approval of methodologies to those recognized by the CDM, and a handful of other projects approved by the Secretariat.²⁵⁰ The stricter methodologies limits participation in the certification program, but has ensured that more certified projects achieve intended reductions. The Chicago Climate Exchange (CCX) also employs third-party verifiers, and once again presumptively approves DOEs recognized by the CDM.²⁵¹

243. *See Who We Are*, VERIFIED CARBON STANDARD, <http://v-c-s.org/who-we-are> (last visited Apr. 24, 2012).

244. *Id.*

245. VERIFIED CARBON STANDARD, VCS PROGRAM GUIDE 15-17 (2012).

246. *Id.*

247. *Id.* at 17-18.

248. THE GOLD STANDARD, THE GOLD STANDARD REQUIREMENTS: VERSION 2.2 22-23 (2012).

249. *TAC & Rule Updates*, THE GOLD STANDARD, <http://www.cdmgoldstandard.org/project-certification/tac-update> (last visited May 10, 2012).

250. THE GOLD STANDARD, *supra* note 248, at 22.

251. CHI. CLIMATE EXCH., VERIFICATION MANUAL 6 (2011).

VII. EXPANDING MARKET LINKAGES THROUGH THIRD-PARTY VERIFICATION OF MONITORING AND REPORTING PROCEDURES

Third-party verifiers are very much the backbone of carbon trading markets. In the EU ETS, third-party verifiers are called upon to independently assess and provide an opinion on the quality and accuracy of operator's annual emissions reports.²⁵² EU operators are encouraged to consult third-party verifiers on auditing control standards and ensuring the development of a proper monitoring plan.²⁵³ Although New Zealand's ETS participants are not required to use third-party verification unless they intend to use a unique emissions factor in their calculation-based measurement methodology, most participants elect to use third-party verifiers, and are encouraged to do so by New Zealand's EPA.²⁵⁴ The CDM depends heavily on third-party verifiers for developing CDM-approved methodologies for various offset projects and ensuring that emissions reductions are being achieved.²⁵⁵ As a consequence, most voluntary standards also depend on third-party verifiers because they rely so heavily on CDM methodologies and require similar third-party auditing of any voluntary carbon reduction project.²⁵⁶

The three principle barriers to international trading of carbon credits is the (1) lack of mutually acceptable methodologies for measuring carbon emissions and reductions, (2) differing methods for reporting, monitoring, and verifying emission activities, and (3) variation in the number of participating industries and emitters. Since third-party verifiers already play such an important role in emission trading schemes, it seems logical that third-party verifiers could also play an important role in reducing the barriers to international carbon trading. One option to address this problem is to create a

252. Commission Regulation 600/2012, 2012 O.J. (L 181) 1 (EC).

253. *Id.* at para. 15.

254. N.Z. REPORTING GUIDANCE, *supra* note 200, at 7.

255. United Nations Framework Convention on Climate Change, Nov. 28-Dec. 10, 2005, *Report of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol on its first session*, ¶ 26-27, U.N. Doc. FCCC/KP/CMP/2005/8/Add.1 (Mar. 30, 2006).

256. *See, e.g.*, THE GOLD STANDARD, *supra* note 248, at 22-23.

separate international body designed specifically to accredit third-party verifiers, approve emission reduction methodologies, and establish internationally recognized MRV procedures. An international body designed and managed by national and regional regulatory authorities could provide the foundation for developing greater confidence in international carbon trading markets.

Third-party verifiers are already involved in establishing internationally recognized methodologies for calculating carbon offsets. The CDM has approved a wide range of methodologies for offset projects created by accredited DOEs.²⁵⁷ The CDM relies upon DOEs to develop standardized and replicable emission measurement procedures for each project, which can then be applied to similar projects by other participants.²⁵⁸ The CDM process has been rightly criticized for failing to properly oversee the accreditation of DOEs and the approval of methodologies with dubious technical assumptions.²⁵⁹ In particular, the CDM is not equipped to provide verification of emission reductions from each project, especially for projects in countries without a strong history of regulatory oversight. The CDM is also an inherently political body, attached to the unhealthy dynamics of the UNFCCC process. Even if the CDM were to develop a better accreditation process and increase its MRV procedures, it is still designed primarily as a tool for non-Annex I members.²⁶⁰ Its primary concern is not establishing market confidence in tradable emission credits.

An international body similar to the International Accounting Standards Board (IASB) could address this problem by formulating agreed upon rules and procedures for accrediting third-party verifiers, evaluating methodologies for calculating emission reductions, and verifying emissions through appropriate monitoring and reporting requirements. Like the IASB, the international body would consist of members of the private sector engaged in international carbon trading, but would also include national or regional authorities who regulate carbon markets.

257. See CDM Methodology Booklet, *supra* note 98.

258. *Id.*

259. See Michael Wara, *Measuring the Clean Development Mechanism's Performance and Potential*, 55 UCLA L. REV. 1759 (2008).

260. *Id.* at 1763 (discussing the strategic manipulation of CDM baselines).

The organization's goals would be to establish a rigorous accreditation process for third-party verifiers such that if a company met the body's accreditation requirements it would be recognized as a third-party verifier in all participating carbon markets, as well as with the CDM. In addition, the body would evaluate and approve methodologies for carbon offsets, independent of the CDM, which, if approved, could be traded internationally in all participating carbon markets. This would provide a guarantee to any investor in a carbon offset project that the credits would be able to be traded at a specified value in any participating carbon markets. Finally, the body would maintain approved MRV procedures, including appropriate calculation-based methods for various industrial processes, standards for calibrating and maintaining continuous monitoring devices, standards for record-keeping and reporting, and internal and external review procedures, including standards for third-party verification.²⁶¹

VIII. CONCLUSION

The collapse of the UNFCCC's Kyoto Protocol has created a chaotic international regulatory environment that threatens to undermine confidence in newly formed, or forming, carbon trading markets. Rather than wait for the international environment to improve, an alternative approach is to encourage internationally recognized environmental auditing standards that would allow the transnational coordination of trading markets and improve the transparency of carbon credits and offsets. Although potentially difficult to establish, such standards could serve to fill in the gaps left by the failed Kyoto Protocol, allowing countries with the political will to move forward without waiting for a consensus-based process.

An international body similar to the IASB could facilitate international carbon trading by setting standards for the accreditation for third-party verifiers, evaluating and approving

261. Although ISO 14065:2007 provides international standards for validating and verifying carbon emissions, and various other technical bodies have similar standards, an international body could facilitate the harmonization of carbon markets by adopting standards that would be mutually recognized by each member's national regulatory authority.

methodologies for calculating carbon emissions and reductions from offsets, and coordinating the harmonization of technical standards for MRV procedures. Although not a replacement for the Kyoto Protocol's carbon trading mechanisms, an independent international body formed by private parties engaged in carbon trading and by national and regional authorities that regulate carbon markets could provide investors and financial intermediaries with an assurance that a carbon credit purchased in one market can be readily traded with another market without the risk that the regulating authority will refuse to recognize its validity. This would improve the functioning of carbon markets by increasing market efficiency, allowing firms to recognize greater benefits from participating in emission trading schemes.