

*Towards a Global Carbon Market: Legal and Economic Challenges of
Linking Different Entity Level Emissions Trading Schemes*

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Abstract

This paper focuses on linkages between different emissions trading schemes that allow private legal entities to participate in emissions trading. The paper explores the problem from both a legal and an economic perspective. Absent a consensus on global emissions trading scheme for such entities under the Kyoto Protocol, establishing linkages between different trading schemes currently seems the most promising way to establish a global Greenhouse Gas (GHG) certificate market and come closer to a global price of GHG abatement.

Different schemes with very different design features have been proposed and partly also implemented in the recent past years. My paper examines the EU ETS, the Canadian Large Final Emitter System, the Regional Greenhouse Gas Initiative (RGGI), the New South Wales Abatement scheme, the Norwegian emissions trading scheme, and the Chicago Climate Exchange in the form of legal case studies focusing on their legal status and various elements of their design and the relevance of these characteristics for linking into other schemes. I also take into account the role of the Kyoto Protocol commitments and flexible mechanisms in the different schemes, as their role for compliance will be considerable in the 2008-2012 period and they therefore play an important role with respect to linking.

From that basis, I draw conclusions regarding the possibility to link these schemes and the potential effects of linking on environmental integrity of the schemes, as well as on their economic efficiency and equity. The major legal obstacles to linking are to be found in different international commitments behind the different schemes and in constitutional restrictions with respect to sub-domestic schemes. Three design elements emerge as the major potential obstacles to linking: The presence or absence of an absolute cap on emissions, different rules on credit generation and recognition, and finally, differences in penalty regimes. Ultimately, I make recommendations as to which degree of harmonization is required between schemes and which legal/economic gateways could be established in order to make linking possible and address detrimental effects of design differences in case of linking.

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A. Introduction and background to the linking of emissions trading schemes

I. Scope of research¹

Rhetorical celebrations on the take-off of the global carbon market have been frequent since 2005. After it had still been tentative about the development of the market in 2003 ('emerging, but fragmented')² and in 2004 ('ready for take-off')³, in 2005 the International Emissions Trading Association (IETA) saw the "rubber hit the road" in its yearly report.⁴ With the carbon market now on the road, it has nevertheless to be asked who or what is driving and where it is headed. And it has to be asked, how global the present carbon market really is. Emissions trading as an instrument is widely discussed worldwide today, but only partly implemented.⁵ The project-based mechanisms of the Kyoto Protocol are growing fast in numbers, but not necessarily in all world regions. Are the verbal celebrations of a global carbon market coming too early? Is there, with the instruments currently in existence and stage of preparation, really a road towards a global carbon market with high liquidity, maximal fungibility of traded commodities and, above all, positive environmental effects on a global scale?

Indeed, a lot has happened with respect to emissions trading in the recent past: In Europe, several schemes have been developed⁶, the EU ETS being the most prominent

¹ This paper is based on a supervised final research paper written in the course of my LL.M. studies at McGill University, Montréal, Canada in 2005-2006 under the supervision of Professor Richard Janda, whom I would hereby like to thank for his support in this project and our very inspiring exchanges on climate change law and policy. Further thanks go to Lainy Destin for helpful comments in the last phase of my paper. Any errors or inaccuracies are within my own responsibility. Most sources were last updated in late 2006, but I have incorporated some recent developments until March 2007 as well. Comments and criticism are welcome under christoph.meitz@email.de.

² International Emissions Trading Association, *Greenhouse Gas Market 2003 – emerging but fragmented* (Geneva: IETA, 2003), online: IETA <<http://www.ieta.org/ieta/www/pages/getfile.php?docID=169>>.

³ International Emissions Trading Association, *Greenhouse Gas Market 2004 – ready for take-off* (Geneva: IETA, 2004), online: IETA <<http://www.ieta.org/ieta/www/pages/getfile.php?docID=720>>, [IETA report 2004]; for 2004 see also Franck Lecocq, *State and Trends of the Carbon Market – 2004*, (Washington D.C., The World Bank, 2005),

⁴ International Emissions Trading Association, *Greenhouse Gas Market 2005 – The rubber hits the road* (Geneva: IETA, 2005), online: IETA <<http://www.ieta.org/ieta/www/pages/getfile.php?docID=1742>>.

⁵ One of the most comprehensive current works on emissions trading is David Freestone & Charlotte Streck, eds., *Legal Aspects of Implementing the Kyoto Protocol Mechanisms – Making Kyoto Work* (Oxford: Oxford University Press, 2005) [hereinafter Freestone & Streck].

⁶ For the UK: Dodwell, Chris, "UK Emissions Trading Schemes", in: Freestone & Streck, *supra* note 5, p. 445 [Dodwell]; Netherlands: Daniel van der Weerd, CERUPT and ERUPT Contracts, in: Freestone & Streck, *supra* note 5, 313, [Van der Weerd] at p. 314; Norway: Online: Miljoeverndepartementet

example. Outside Europe, Chile⁷ has set up a scheme in South America, and Australia has introduced a National renewable energy trading scheme⁸ In the US, there are legislative proposals for nation-wide emissions trading as well.⁹ Further, there is the sub-national Regional Greenhouse Gas Initiative driven by a number of states in the Northeast of the United States,¹⁰ and California has recently announced to take cap-and-trade approach to GHG emissions.¹¹ There is further a sub-national scheme being set up in the Australian state of New South Wales.¹² Linking efforts have taken place between the EU ETS and Norway. Iceland and Liechtenstein are also expected to link up with the EU ETS in 2008.¹³

The global ‘carbon economy’ is today based on a mix of international treaties and decisions, regional and domestic schemes as well as sub-domestic schemes. In order to make a global carbon market a reality, proper linkages have to be established between these instruments, in order to enable exchanges of the ‘currencies’ or ‘commodities’ traded in them. There are two principal options for trading parties in entity level emissions trading schemes: Either only operators of installations with reduction obligation / countries with targets are enabled to trade units (closed trading scheme), or all legal persons, potentially with some restriction by nationality (open scheme). The latter approach takes account of several entities who are not emitters themselves in buying credits for investment and speculative purposes (funds), acting as intermediaries (brokers and exchanges) or for environmental purposes (governments and NGOs). This paper will exclusively look at open trading schemes.

Therefore this research paper aims at exploring the possibility of establishing linkages between different emissions trading and credit schemes. This paper will limit itself to

(Norwegian Ministry of the Environment) < <http://www.dep.no/md/english/doc/legislation/acts/022051-200015/dok-bn.html>>; Denmark: Online: Danish Energy Authority <<http://www.ens.dk/sw20662.asp>>;

⁷ Chile: Marcela Main S. “Pollution Permit Trading in Chile”, in: Freestone & Streck, *supra* note 5, p. 461.

⁸ Josh Carmody and Monique Willis, “Emissions Trading Schemes in Australia”, Freestone & Streck, *supra* note 5, p. 479 [Carmody & Willis].

⁹ Pew Center on Global Climate Change, “Summary of The Lieberman-McCain Climate Stewardship Act”, online: Pew Center <http://www.pewclimate.org/policy_center/analyses/s_139_summary.cfm>.

¹⁰ Online: Regional Greenhouse Gas Initiative <www.rggi.org>.

¹¹ See online: Government of California <http://www.climatechange.ca.gov/documents/2006-09-27_AB32_GOV_NEWS_RELEASE.PDF>.

¹² Carmody & Willis, *supra* note 8, at p 481ff, the website of the scheme is to be found under: <<http://www.greenhousegas.nsw.gov.au>>.

¹³ See presentation by Thomas Bernheim of the EU Commission, online: <<http://ji.unfccc.int/UserManagement/FileStorage/G3KP8B7UZ9FNKI6B93UA2ZWRQJI5O1>>.

addressing the design features of trading schemes allowing private legal entities to trade in units. In order to complete that task, I will first recall the basic economic rationales and pitfalls of the concept of emissions trading.

Then, in the main part of my paper, I will undertake case studies of different emissions trading schemes in operation or preparation based on the theoretical framework described before. Rights to emit in different systems will be referred to under the general term of units for this purpose. This term will include all rights that can be defined as rights to emit a certain quantity of a specified substance during a defined time period.¹⁴ One first element of analysis will be the relevance of different legal systems for linking emissions trading schemes and make proposals on linking into sub-domestic and privately organized schemes.

I then will undertake an analysis of design features which will be divided into three parts: Scheme Coverage and definition and recognition of tradable units (B.II), Target-setting and allocation of emissions rights (B.III) and compliance and penalty framework (B.IV) For each of these points I will first provide an assessment of the benefits and risks they cause in case of linking. In particular, my examination will provide an introduction to the relevant Kyoto Protocol provisions as the background to a (potentially) global emissions trading regime. When commenting on Kyoto rules, I will generally assume at least basic willingness of the Kyoto parties to accept the standards of the Protocol and the Protocol itself.¹⁵ I then will look at the features of some important specific trading schemes: The analysis will cover the EU ETS, the US RGGI emissions trading system and the Canadian Large Final emitter system as it had been proposed by the former liberal government of Canada.¹⁶ Further schemes used to provide examples will be the

¹⁴ Rutger de Witt Wijnen, Emissions Trading under Article 17 of the Kyoto Protocol, in ”, in: Freestone & Streck, *supra* note 5, [hereinafter: De Witt Wijnen], at p. 404.

¹⁵ Recent events, like the unwillingness of the Canadian conservative government to accept any international commitments in the climate area, of course cast some doubt on this assumption. But without some basic commitment by state actors, a multilateral framework like Kyoto cannot be imagined to function properly, which is why I stick to this assumption.

¹⁶ The Canadian scheme in this form has been abandoned as a political project by the current conservative government, see Canada, Minister of the Environment Rona Ambrose, speech “Announcement Concerning Canada’s Clean Air Act” (19 October 2006), online: Environment Canada <http://www.ec.gc.ca/minister/speeches/2006/061019_s_e.htm>; the design of the proposal nevertheless deserves a closer look as it provides good examples of some design pitfalls, and this kind of proposal is still advocated by the leadership of the liberal party, and might therefore also be of practical relevance in the future, see for example Michael Ignatieff, press release, “Kyoto and beyond: Options for long-term

Norwegian scheme, which is currently in linking negotiations with the EU ETS and the scheme in the Australian state of New South Wales. The Chicago Climate exchange will serve as an example of a private initiative. I will also incorporate first practical experiences with emissions trading on a larger scale, in particular from the EU ETS.

Within each point of analysis, I will then summarize the most relevant problems for linking the existing schemes and describe different ‘legal gateways’ that have been proposed to overcome these challenges.

The paper is explicitly not focusing on technical requirements of linking such as:

Monitoring, reporting and verification: In order to maintain its environmental integrity, each scheme has to put in place rules and methodologies regarding the continuous monitoring of emissions, reporting requirements for each emitter and independent verification of emissions data. The same, of course, applies to linked schemes. I am not going to examine methodologies in details, (they are often a question of fact and application of rules) but confine myself to noticing that all schemes I have examined do contain regular reporting obligations at the entity level.¹⁷ With respect to

reductions in Canada’s greenhouse gas emissions“ (21 August 2006), online:

<<http://www.michaelignatieff.ca/docs/Forms/Climate%20Change%20Policy%20Outline.pdf>>.

¹⁷ The EU ETS contains a yearly reporting obligation for installations, see EC, Commission, Commission Decision of 29 January 2004 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council [2004], O.J. L. 59/1, Online: <http://eur-lex.europa.eu/pri/en/oj/dat/2004/l_059/l_05920040226en00010074.pdf>, [EC guidelines on monitoring and reporting], para. 5; EC, *Directive 2003/87/EC of the European Parliament of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (text with EEA relevance)* [2003] O.J. L. 275/32,, Art. 14.1; Annex IV of EC Directive 2003/87 contains principles on monitoring and reporting; guidelines are contained in the EC guidelines on monitoring and reporting, EC, Commission, *Commission Decision of 29 January 2004 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council* [2004], O.J. L. 59/1, Online: <http://eur-lex.europa.eu/pri/en/oj/dat/2004/l_059/l_05920040226en00010074.pdf>, [EC guidelines on monitoring and reporting], they refer to principles of completeness, consistency, transparency, accuracy, cost-effectiveness, materiality, faithfulness and they shall enable operators to improve their performance in monitoring and reporting (para.3); The RGGI monitoring and reporting obligations for emitters are based on the US federal rules on continuous emission monitoring, see RGGI model rule, *supra* note 160, XX-8.1.; it refers to 40 CFR part 75. (Code of Federal Regulations) – Other monitoring systems are prohibited unless the operator obtains the consent of the regulatory authority XX-8.1 (d) (1) and XX-8.6 RGGI Model Rule; There are quarterly reporting obligations of operators, RGGI Model Rule, *supra* note 160, XX-8.4 (d); In the Canadian plans, there is a yearly duty of operators to report emissions intensity of installations; there was supposed to be a nationwide “single, harmonized system for mandatory reporting of greenhouse gas emissions and related information”, that was to be based preferably on internationally accepted protocols. Canada, Instructions Cross-cutting Provisions, *supra* note 146, paras. 12,13; also in Canada, Notice of intent, see *supra* note 147, at para 4.1 and para. 4.4; The Norwegian scheme contains a yearly reporting obligation for operators. The details of measurement and calculation of emissions shall be addressed by regulations Greenhouse Gas Emissions Trading Act, *supra* note 152, at

emissions monitoring, all examined schemes have their own methodologies in place and independent verification of emissions is an important element in all schemes, too.¹⁸

Registries: Trade in emissions units in general requires functioning registries, if it comes to linking, this condition must be fulfilled in all of the linked schemes. Registries must allow for the trackability of all units as to their origin, validity and previous owners and allow trading without substantial additional cost. All schemes examined here have put in place registries that fulfill this condition¹⁹, so only some technical harmonization may be required in order to ensure the interchangeability and trackability of units. The Marrakesh Accords and subsequent decisions set out such a harmonized framework for the Kyoto parties²⁰ which may also assist in building a global entity-level emissions trading market.

Standardization: The influence of common standards for, monitoring, verification and credit generation in emissions trading is uncertain so far, as different standards are in existence, but its influence is likely to grow in order to achieve fungible credits. Although standardization does not have binding force on regulators or emitters directly, references to common standards within different schemes will create a higher degree of transparency and facilitate the development of linkages. Agreeing on common standards may be an important element in the linking processes. Standardization efforts so far have been

para. 16; The CCX uses the WRI/WBCSD emissions calculation methodologies, see Presentation of the Chicago Climate Exchange by Michael J Walsh, Senior Vice President of the CCX, p. 20., see online: <<http://www.eesi.org/briefings/2005/Climate%20&%20Energy/4.25.05CarbonTrade/Walsh4.25.05.pdf>>; see also World Resources Institute, Article “Corporations take the Lead on Climate Change”, online: <<http://www.chicagoclimatex.com/news/articles/archive/2004/newsScroller2005021601161379.html>>.

¹⁸ My master’s paper contained more material on monitoring, reporting and verification which I omitted here, in case of interest in my master’s paper, please contact me via christoph.meitz@email.de.

¹⁹ The Marrakesh Accords establish the UNFCCC independent transaction log as an accounting hub for all Kyoto units, see UNFCCC COP Decision 19/CP.7, Annex; In addition, there is a CDM registry, UNFCCC COP Decision 17/CP.7, Appendix D; see also Hobley & Hawkes, *supra* note 292, at p. 132; The EU ETS obliges member states to have GHG registries through which the trading takes place. As an addition to this, the Community maintains an independent transaction log which is publicly accessible through the Internet; See online: EU <<http://ec.europa.eu/environment/ets/welcome.do>>; Switching to just one community-wide registry is an option discussed, EC Directive 2003/87, Art. 30.2(f); with respect to RGGI see *See supra*, the allowance tracking system will be the same for all states and be managed by the ‘regional organization’, a private law entity that the RGGI states intend to establish as well as technically implemented through the Eastern Climate Registry, see *supra* note 163, RGGI MOU, 4.A(2); for Canada, see Offset system for Greenhouse Gases, Overview Paper, p. 6; The CCX provides a confidential registry for its members, see online: <<https://registry.chicagoclimatex.com/>>; Electricity Supply Amendment Act 2002, *supra* note 269, § 97G.

²⁰ UNFCCC COP Decision 16/CP.7 para. 21(d) (JI); UNFCCC COP Decision 17/CP.7 para 31(d) (CDM); UNFCCC COP Decision 18/CP.7 Annex para 2(d) (IET); Kyoto Protocol MOP Decision 12/CMP.1.

undertaken by the International Organization on Standards (ISO),²¹ the WRI/WBCSD²² and the IPCC.²³ They will not be discussed in detail here.

II. The economic rationales and problems of emissions trading in a globalized economy

1. Economics and the Environment: The problem of externalities

Emissions trading schemes are market-based economic instruments designed to address an externality problem. Economists speak of an externality in a case where the price of a good or service does not reflect some cost or benefit accruing to a third party or society as a whole as a result of the production, transfer or consumption of it.²⁴ Such external costs are particularly frequent with respect to the environment, where often the price of a good does not reflect the cost of the pollution created by its production or the cost the product will cause as waste at the end of its life-cycle. In case of the environment, the externalities mostly result from the use of public goods or commons. Public goods are goods that are non-exclusive and non-rival in consumption, meaning no one can be excluded from their use and that the use of the good by one person does not preclude the consumption by another person.²⁵ Such free accessibility is likely to lead to

²¹ The three new standards issued by ISO are: ISO 14064-1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals, ISO 14064-2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements, ISO 14064-3: Specification with guidance for the validation and verification of greenhouse gas assertions; ISO 14065, which is expected to be issued in late 2006, will contain detailed conditions for the accreditation and recognition of bodies validating or verifying credits, see IETA GHG Market Report 2005, *supra* note 2, at p. 16.

²² See *supra* notes 355 and 356.

²³ See IPCC, revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (1996), online: <<http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>>, these guidelines related rather to national inventories, but also provided guidance with respect to entity level reporting. There is further a good practice guidance for LULUCF, online: <<http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf.htm>>.

²⁴ See generally Richard A. Ippolito, *Economics for Lawyers* (Princeton: Princeton University Press, 2005) [Ippolito], p. 229; see also Thomas J. Miceli, "Property", in: Backhaus, Jürgen G., *The Elgar Companion to Law and Economics* (2nd Ed.), (Cheltenham UK, Northampton, MA: Edward Elgar Publishing Ltd., 2005), 246, who puts an emphasis on the irrelevance of the externality for the decision-making of parties to a transaction; this irrelevance, however, will most of the times be caused by the absence of price signals reflecting the presence of third party costs or benefits.

²⁵ Kaul, Inge, et. al. (eds.), *Global Public Goods – International Cooperation in the 21st Century* (New York: Oxford University Press, 1999), at p. 3.

over-use and depletion.²⁶ Environmental media such as air, water and soil are examples of such public or “open-access” goods. Since the work of *Demsetz*²⁷ and *Hardin*’s famous Article “The Tragedy of the Commons” the establishment of “property rights” is seen as one possible approach to prevent excessive use of the commons.²⁸ The term of property rights is conceived in a very wide fashion here, encompassing private, common and public rights restricting access to a specific resource.²⁹

The atmosphere does not lend itself as easily to a property-rights-based approach due to air circulation and the trans-boundary movement of pollutants. This does not mean that air pollution regulation had not come into being: With respect to air, the main focus of regulators has for a long time been local pollution by plants which was directly harmful to humans, animals and vegetation.³⁰ The regulation of air pollution came across more as a restriction on property rights of the owners in emitting installations, such as factories.³¹ The discharging of GHGs into the atmosphere has, unlike the discharge of other pollutants, not been restricted until very recently, particularly as no immediately visible or local effects are connected to it.³² But with the growing knowledge about the potential of GHGs to cause global warming and several other climate effects, it has become obvious that there will be a growing external cost related to emissions of GHGs, as unlike other pollutants, GHGs are very stable in the atmosphere and have climatic effects on a global scale.³³ Two challenges for future environmental regulation can be deduced from this:

²⁶ Daniel H. Cole, “From Local to Global Property: Privatizing the global environment?: Clearing the Air: Four Propositions About Property Rights And Environmental Protection” (1999) 10 *Duke Env’t L. & Pol’y F.*, 103 [Cole (1999)], at p. 106.

²⁷ Harold Demsetz, “Toward a theory of property rights” (1967) *American Economic Review* 57, 347-359.

²⁸ Garrett Hardin, “The tragedy of the commons” (1968) 162 *Science* 1243.

²⁹ Cole (1999), *supra* note 26, at p. 105, who goes as far as to describe all solutions to environmental problems as necessarily “property-based”. The notion of property rights may cause some confusion here for the continental jurist, as in European civil law systems the notion of property is usually used in a much more narrow sense that restricts its meaning to private/individual rights.

³⁰ See for example *The Clean Air Act*, 42 U.S.C. s/s 7401 et seq. (1970), § 163, regarding emissions limitations on particulates and sulphur dioxide (SO₂).

³¹ But see also Cole (1999), *supra* note 26, at p. 111, who understands all command-and control regimes as implicitly containing public property rights. If transfers are allowed, he sees a combined private/public system at work.

³² Bernhard Hillebrand et.al., *CO₂ Emissions Trading Put to Test* (Münster, Lit Verlag, 2002) [Hillebrand], p. 5.

³³ See in particular IPCC, *Climate Change 2001: Synthesis Report. A Contribution of Working Groups I, II and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2001) [hereinafter IPCC TAR].

1. It should aim at reductions in global GHG emissions which would reduce the overall size of the external cost related to thousands of products
2. The external costs connected to GHG emissions should, at least partly, be reflected in the price of products that are made based on emissions of GHGs.

With respect to the second point it should be noted that no producer has a genuine incentive to include such costs in his product pricing, as this would put him at competitive disadvantage to his competitors which would continue to make use of the atmosphere.³⁴ There are two major approaches to the inclusion of externalities in prices of products and services:

Price-based: First, the price of the pollution-causing activity can be controlled. Taxation is typically proposed as the means of choice here. *Pigou* in 1932 formulated the idea of a tax on negative external effects of economic activity.³⁵ The basic approach of such a tax is to determine the level of damage caused by certain emissions levels and then impose a tax on such emissions that equates the marginal net private benefit flowing from the emitting activity.³⁶ This approach has been criticized in its details³⁷ and refined by later works (e.g. the standards and pricing approach).³⁸

Amount-based: The second approach to pollution attempts to limit pollution by setting a fixed maximum amount of pollution allowed, dividing it in standardized units, and allocating it throughout the economy. As a second step there can be an option for polluters to trade their pollution rights (pollution trading/emissions trading). The initial

³⁴ David M. Driesen, *The Economic Dynamics of Environmental Law* (Cambridge, MA: MIT Press, 2003) [hereinafter Driesen, *Economic Dynamics*] p. 139, Cole (1999), *supra* note 26, at p. 106.

³⁵ Pigou, Arthur Cecil, *The Economics of Welfare* (4th Ed.) (London: Macmillian and Co.,Ltd., 1932 (reprint 1948)(1st edition 1920) at p.192.

³⁶ Paul Ekins & Terry Barker, "Carbon Taxes and Carbon Emissions Trading", in: Nick Hanley and Colin J. Roberts, *Issues in Environmental Economics* (Oxford: Blackwell 2002), p. 75 [Ekins & Barker] at. 78.

³⁷ Ronald H. Coase, "The Problem of Social Cost" (1960) *J.L. & Econ.* 1 at p. 44; Baumol, William J., "On taxation and the control of externalities (1972) 62 *Am. Econ. Rev.* 307, at p. 316.

³⁸ Baumol, William J. & Oates, Wallace E., "The use of standards and prices for the protection of the environment" (1971) 73, *Swedish J. of Econ.* 42.

allocation can happen by auctioning³⁹ of pollution rights or by relying on some historic figure of pollution originating from one polluter (grandfathering)⁴⁰.

This paper shall deal with the latter approach, always keeping in mind that the larger challenge of GHG emission reduction cannot be mastered by emissions trading alone and that price-based policy options well deserve consideration in a larger policy context.⁴¹ The economic efficiency goal behind emissions trading shall be recalled briefly (2) before referring to the effects of emissions markets being artificially created markets (3) which are situated in a context of increasingly liberalized global trade (4).

2. The effects of emissions trading schemes as economic instruments

It is known that it is of minor importance for the objective of climate protection, where on the planet emissions of GHGs are reduced. Transfers of emissions rights between countries thus do not per se limit the effectiveness of the underlying GHG reduction programs. The idea of allowing for transfers of emissions rights between states or single polluters can also be supported by economic models. From an economic perspective, all policies should achieve their goals with a maximum of economic efficiency, i.e. causing maximum gains and as little cost in the economy as a whole as possible.⁴² It is further known that the marginal costs of GHG abatement differ as between different emitting sites. Thus, a system of transferable permits for GHG emissions should, at least in theory,

³⁹ For arguments in favor of auctioning see Peter Cramton & Suzy Kerr, *Tradable permit auctions: how and why to auction not grandfather*, Resources for The Future Discussion Paper 98-34 (Washington DC: Resources for the Future, 1998)

Online: Resources for the Future Foundation <<http://www.rff.org/rff/Documents/RFF-DP-98-34.pdf>>, at p. 10 and following.

⁴⁰ Auctioning generates government revenues which can be used for policy purposes, such as reducing distortionary taxes. They also spread the cost of carbon control and the gain of permit allocation more evenly throughout society and make difficult and contestable decisions about allocation unnecessary and allow for fair access to permits small producers and new entrants. Auctioning, on the other hand, means additional cost to emitters that can reduce their competitiveness. Grandfathering on the other hand reflects the social contract of the state with polluters and gives them certainty regarding their possibilities to emit and previous investments. Both approaches to allocation constitute a redistribution of wealth, the difference between them lies in the shifts of wealth produced; see Paul Ekins & Terry Barker, "Carbon Taxes and Carbon Emissions Trading", in: Nick Hanley and Colin J. Roberts, *Issues in Environmental Economics* (Oxford: Blackwell 2002), p. 75 [Ekins & Barker]

⁴¹ Compare David G. Duff, "Tax Policy and Global Warming", (2003) Public Law and Legal Theory Research Paper No. 03-03, Law and Economics Research Paper No. 03-04, online: <<http://papers.ssrn.com/abstract=428320>>.at p. 70,71.

⁴² Compare Coase, *supra* note 37, at p.44; Stephen Bygrave & Martina Bosi, "Linking Project-Based Mechanisms with Domestic Greenhouse Gas Emissions Trading Schemes" (Paris: OECD/IEA, 2004) Online: OECD <<http://www.oecd.org/dataoecd/38/8/32181359.pdf>>, at p.15.

allow for the reductions in GHGs to be made at the site with the lowest cost per unit of reduction, an outcome that is economically efficient.⁴³

If we project this model to the global scale, the findings remain largely the same: As the average cost of GHG reductions differs significantly between different countries, transfers of units between countries (or entities located in different countries) should allow for an economically efficient outcome, meaning the achievement of the desired CO2 reductions at the minimum cost for the world economy, in particular for countries with reduction commitments.⁴⁴

Economic dynamics: In reality, however, this approach of always trying to obtain reductions at the lowest possible cost can conflict with other objectives and requirements of a long-term oriented climate policy, such as the promotion of less GHG-intensive technologies. These may require high initial investments and thus not seem as the economically most efficient solution in the first place.⁴⁵ The question that arises here is which economic dynamics an emissions trading scheme creates.⁴⁶ This again underlines again that emissions trading cannot stand alone in an attempt to achieve GHG reductions.⁴⁷

Emissions trading and credit schemes will likely lead to some redistribution of wealth following from unit allocation and project financing. Unit allocation can be done by auctioning or based on some historic figure of emissions (grandfathering), two approaches that differ in where revenue is created in the allocation process. If project-based mechanisms like the CDM are used to create credits, this will cause some transfers of wealth from emitters under a trading scheme to project proponents. Such transfers on

⁴³ Woerdman, Edwin, "Tradable emission rights", in: Backhaus, Jürgen G., *The Elgar Companion to Law and Economics* (2nd Ed.), (Cheltenham UK, Northampton, MA: Edward Elgar Publishing Ltd., 2005), p. 364, [Woerdman] at p. 364.

⁴⁴ David Freestone, "The UN Framework Convention on Climate Change, the Kyoto Protocol, and the Kyoto Mechanisms", in: Freestone & Streck, *supra* note 5, p. 3, [hereinafter Freestone, Kyoto Mechanisms] at p. 11.

⁴⁵ David M. Driesen, "Free Lunch or cheap fix? The Emissions Trading Idea and the Climate Change Convention", (1998) 26 B.C. Env'tl. Aff. L. Rev. 1, [hereinafter Driesen, Free Lunch] at p.42.

⁴⁶ This includes influences of emissions trading on governance processes costs and investment and innovation decisions which by themselves create efficiencies that are not necessarily taken into account by a static analysis., see for more detail Driesen, *Economic Dynamics*, *supra* note 34, p. 212.

⁴⁷ Driesen, Free Lunch, *supra* note 45 at p. 79-81.

the international level have been welcomed, but sometimes also criticized as economically inefficient and politically detrimental.⁴⁸

3. Artificial markets and their possible failures

Emissions rights can be defined “as the right to emit a certain quantity of a specified substance during a defined period of time.”⁴⁹ The units that are tradable on emissions permit markets are not subject to inherent limitations, as for example exist with respect to perishable goods. A carbon credit is good as long as a regulation so stipulates, unlike other products that will deteriorate, become unfashionable or technologically obsolete over time and therefore become unmarketable, regardless of what regulations say about their market access.

Ultimately, emissions trading schemes’ rules are rather comparable to accounting rules. If the rules of control are insufficient, the pure existence of a credit and trading scheme does not indicate any level of environmental performance.⁵⁰ The scarcity in an emissions trading scheme is just as artificially created as all the other features of emission allowances.⁵¹ If scarcity is not maintained sufficiently, a ‘credit inflation’ can occur, lowering the price of each unit and the pressure to achieve real GHG emission reductions. With respect to the EU ETS, such an effect has occurred due to obvious over-allocation by member states.⁵² But though artificially created, an emission unit market is susceptible to influences and problems known from classical markets. If information on the real

⁴⁸ See for example Article in the Canadian National Post relating to an HFC-23 destruction project undertaken under the CDM, online:<<http://www.canada.com/nationalpost/news/story.html?id=eb0445d8-f79c-47da-9c73-00122a364611>>.

⁴⁹ Rutger de Witt Wijnen “Emissions trading under Article 17 of the Kyoto Protocol”, in: Freestone & Streck, *supra* note 5, 403.

⁵⁰ Matthew Bramley of the Pembina Institute in a hearing on the Large Final emitter system, 37th Parliament (3rd Session), Standing Committee on Environment and Sustainable Development, Evidence, Contents (March 24, 2004), Online: <<http://www.parl.gc.ca/committee/CommitteePublication.aspx?SourceId=76346>> [Bramley hearing], 15.35h [absent any other structure in this document, the speaker is quoted by the time he made the respective statement].

⁵¹ Compare Bruce Yandle, “From Local to Global Commons: Private Property, Common Property and Hybrid Property Regimes: Grasping for the heavens: 3-D Property rights and the Global Commons” (1999) 10 *Duke Env’t L. & Pol’y F.*, 13, at p.23.

⁵² The spot price for EU allowances dropped towards a level of about 1 € in early 2007 after having been around 15 € for a while, see online: <<http://www.carbonpool.eu/>>; evidence for over-allocation can be found in the overview of allocation to EU installation as compared to the actual emissions figures, see EU website, online: <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/612&format=HTML&aged=1&language=EN&guiLanguage=en>>.

scarcity of units is incomplete, the price of units may not reflect marginal abatement cost. If the information situation changes rapidly, price jumps can occur.⁵³ The emissions unit market is also not safe of speculative action if it is open to all kinds of investors,⁵⁴ which is the case in all schemes examined here.⁵⁵

4. Emissions trading in a market-based world economy

Trade in goods and services: These artificial markets created by emissions trading schemes are additional to markets already existing. In the recent decades, the international markets for goods and services have seen considerable liberalization of trade rules driven by GATT and WTO rounds. As a consequence to these trade developments, competition in many energy-intensive production sectors is worldwide by today.⁵⁶ Electricity markets have been very strongly liberalized in the past years,⁵⁷ although they still tend to be more confined to particular world regions.⁵⁸ Emissions markets for private companies to the very contrary have tended to be fragmented markets so far.⁵⁹ Only the EU ETS covers the same area that is covered by European economic integration.⁶⁰ If the average price of GHG abatement differs significantly for different countries/regions which are trading partners, regions with relatively high abatement cost will face disadvantages with respect to competition in spite of having introduced emissions trading. Such ‘leakages’ will, according to economic theory, occur where an emissions reduction system imposes costs on participants, but does not have global

⁵³ This happened in May 2006 when the first figures on verified emissions were published for the EU ETS. These made clear that there was a extremely more abundant supply of allowances than anticipated by market participants previously and caused an allowance price drop of around 50 percent, see Point Carbon, press release, “Unconfirmed Data Shows EU Emissions well below limit”, 12 May 2006, Online: Point Carbon <http://www.pointcarbon.com/wimages/Press_release_Point_Carbon_12_May_2006_1.pdf>.

⁵⁴ Bloomberg News, „EU trading of pollution credits fails on goals“ (24 July 2006), Online: Bloomberg News <<http://www.iht.com/articles/2006/07/24/business/carbon.php>>.

⁵⁵ See *supra* p. 1.

⁵⁶ Hillebrand et al., *supra* note 32, at p. 86-87.

⁵⁷ See for the EU online: European Union <<http://www.europa.eu/scadplus/leg/en/lvb/l27005.htm>>; for the US, see online: Energy Information Administration <http://www.eia.doe.gov/cneaf/electricity/chg_stru_update/update2000.html>.

⁵⁸ Electricity networks are restricted by geological barriers like oceans and mountains as well as by poorly developed grids with limited transmission capacity.

⁵⁹ Compare IETA report, *supra* note 3; 2004 Lecocq, Franck, *State and Trends of the Carbon Market – 2004*, (Washington D.C., The World Bank, 2005).

⁶⁰ Which does not necessarily exclude competitive distortions, see *infra* p. 23 and 69.

participation.⁶¹ They may lead to loss of employment and revenue in the regulating jurisdiction. A worldwide market for emission rights could lead to a mitigation of that situation, as ‘world carbon abatement price’ would eventually form and lower the costs for countries that have trouble in achieving cost-effective domestic reductions. Linking of emissions trading schemes between the world major economic regions would be a first step in that direction.

Investment: Another trend of growing importance with respect to emissions reduction obligations is the liberalization of foreign direct investment regimes by many countries. This practice is backed up by the conclusion of more and more multilateral and bilateral investment treaties (BITs).⁶² As a consequence, relocation of production facilities in case of rising cost at a particular location has become a more feasible option recently, considering that the products can be traded much more easily back into the former country of production. As with facilities, also emissions get relocated, so-called ‘emissions leakage’ can be a consequence of these liberalization steps. Emissions reduction commitments being allocated to legal entities by the state in one location of production can potentially create cost increases that are critical for a decision to relocate or not.⁶³ Again, a worldwide emissions market can lower the cost of compliance with reductions commitments passed on to single installations and thus mitigate the pressure leading to relocate.

5. The behavior of different actors: Emissions trading schemes as an example of a prisoners’ dilemma

What is the main obstacle for such a global solution? The additional cost caused by the obligation to hold emissions permits can change the competitive situation within one sector in a specific country or across countries or between whole economies. State actors and corporate emitters will consequently try to minimize the competitive burden they have to bear as a result of an emissions permit system.

⁶¹ Steffen Kallbekken, “Why the CDM can reduce carbon leakage”, CICERO working paper 2006:02, [Kallbekken] p. 1.

⁶² Chris Wold & Sanford Gaines & Greg Block, *Trade and the Environment – Law and Policy* (Durham, NC: Carolina Academic Press, 2005), at p. 725 state that there are now more than 2000 BITs worldwide, which has supported a massive surge foreign direct investment over the last decades, *ibid*, p. 719-720.

⁶³ Hillebrand et al., *supra* note 32, at p. 86-87.

We have to ask whether emissions trading schemes and their linkages are invitations for gaming in the sense of game theory. Game theory, widely used in political science and economics, is used to predict behavior of different actors in complex situations involving imperfect information by taking into consideration the other actors' possible actions.⁶⁴

The prisoners' dilemma is usually applied to situations with relatively few players and describes a setting in which two or more parties would achieve an optimal outcome by cooperation, but each of them faces a high risk in case the other party is betraying.⁶⁵ Betrayal by all parties leads to an outcome that is worse than the optimal one, but for each party far better than being betrayed. If both parties weigh their options for behavior, they will in such a situation consequently all try to betray.

The actions of states with respect to climate change can be described in terms of a prisoner's dilemma.⁶⁶ The potential economic rewards of defaulting on their reduction commitments are rather high for countries, but on the other hand they cannot possibly contribute a lot to combating global climate change by just cutting their own emissions.⁶⁷ There are consequently incentives to cheat in the context of climate protection goals in general, and also with respect to emissions trading in particular. These incentives for cheating occur where states are free to set their own emissions limitations for the trading sector, where emission rights are allocated to single emitters and also where emission figures have to be monitored, reported and verified.⁶⁸ The situation for single corporate entities is comparable: there are incentives to press for low targets and to have the own entity emissions target set as high as possible in order to avoid permit shortage and additional cost.

⁶⁴ Ippolito, Richard A., *Economics for Lawyers* (Princeton: Princeton University Press, 2005), p. 380,381; Henri N. Butler & Christopher R. Drahozal, *Economic Analysis for Lawyers* (2nd Ed.) (Durham, NC: Carolina Academic Press, 2006) [Butler & Drahozal] p. 37.

⁶⁵ Ippolito, *supra* note 64, at p.187; Butler & Drahozal, *supra* note 64, at p. 39.

⁶⁶ Susan J. Kurkowski, "Distributing the Right to Pollute in the European Union: Efficiency, Equity and the Environment" 14 N.Y.U. Env't'l L.J. 698 [hereinafter Kurkowski], at p. 716..

⁶⁷ Compare Kurkowski, *supra* note 66, at p.717.

⁶⁸ Kurkowski, *supra* note 66, at p. 705-707; David G. Victor, *The Collapse of the Kyoto Protocol and the struggle to slow global warming* (Princeton: Princeton University Press, 2001).at p. 63.

III. Methodology

This paper is essentially based on a supervised final research paper written in the course of my LL.M. program in comparative law at McGill University, Montréal, Canada. It will largely rely on classical legal methodology. The major sources will be international, regional and domestic legislation, litigation and scholarship. An interview with a representative of the EU Commission in June 2006 who is in charge of the EU ETS has served as complementary material on current developments. The concepts of emissions trading and project-based emission reduction projects have received considerable attention from governments, international organizations and NGOs over the past decade, due to the adoption of the United Nations framework Convention on Climate Change (UNFCCC)⁶⁹, and in particular subsequent to the adoption of its Kyoto Protocol⁷⁰ in 1997. There is also an increasing amount of scholarly work on emissions trading emerging from the fields of law, economics and environmental science.⁷¹ The central purpose of this paper is to draw from this basic theoretical work, particularly also from economic work and apply its findings to existing and proposed schemes. It shall be examined here whether the findings from these studies regarding the potential benefits and problems of emissions trading schemes and the resulting design recommendations apply to linked schemes as well or whether a reconsideration of design questions is warranted once it comes to linking of two or more schemes. The main questions to be asked in this research framework are: "What is the likely difference in the functioning of a scheme linked to another as opposed to an isolated one. - Which effects occur only due to linking and which effects do occur irrespective of it?" There have been two OECD studies concerning linking that provide a very useful framework of my analysis.⁷²

⁶⁹ *United Nations Framework Convention on Climate Change*, 9 May 1992, 1771 U.N.T.S., 165, Online: UNFCCC <<http://unfccc.int/resource/docs/convkp/conveng.pdf>> [UNFCCC].

⁷⁰ *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 11 December 1997, (UNFCCC COP Decision 1/CP.3.), 11 December 1997, 37 I.L.M. 22, Online: UNFCCC <<http://unfccc.int/resource/docs/convkp/kpeng.pdf>> [Kyoto Protocol].

⁷¹ Haites, Erik & Hornung, Robert, *Analysis of Emissions Trading Design Features*, (Ottawa: NRTEE, 1999), online: NRTEE <www.nrtee-trnee.ca/Publications/PDF/TDESIGNE.pdf>; Nordhaus, Robert R. & Danish, Kyle W., „Assessing the Options for Designing a Mandatory U.S. Greenhouse Gas Emissions Trading Program“ (2005) 32 B.C. Env'tl. Aff. L. Rev. 97; Evans, Brian, "Principles of Kyoto and Emissions Trading Systems: A Primer for Energy Lawyers" (2004) 42 Alberta L. Rev. 167.

⁷² One was focusing on linking the EU ETS with other trading schemes, see William Blyth & Martina Bosi, "Linking Non-EU Domestic Trading Schemes with the EU Emissions Trading Scheme" (Paris: OECD/IEA, 2004), online: OECD <<http://www.oecd.org/dataoecd/38/7/32181382.pdf>>; and the other was

With respect to an analytical framework of environmental measures, there is extensive work on the evaluation of environmental instruments in general, partly also explicitly relating to GHG reduction agreements and emissions trading schemes.⁷³ Criteria for the evaluation of instruments are bundled in different groups. *Wicke*, for example names the following four criteria in his basic work on environmental economics: ecological efficiency, economic consequences, administrative, legal and other feasibility, political feasibility.⁷⁴ *Philibert* and *Pershing* adopt the evaluation criteria of ‘environmental effectiveness, cost-effectiveness, contribution to economic growth and sustainable development, and equity’.⁷⁵ *ECOFYS*⁷⁶ adopts four different categories of criteria, namely ecological criteria, political criteria, economic criteria and technical criteria.⁷⁷

Given that the criteria I use here shall mainly reflect the economic and environmental rationales of emissions trading as outlined above and extend them by a legal analysis, I have decided to adopt three main criteria in this paper: First, I will refer to environmental effectiveness as the paramount goal of GHG regulation, second to economic efficiency as the paramount goal of emissions trading schemes and third, to legal feasibility of linking. Where appropriate, I will also comment on contributions to economic development and social effects and equity, as well as political feasibility of linking.

focusing on linking domestic trading schemes and project-based mechanisms, see Stephen Bygrave & Martina Bosi, “Linking Project-Based Mechanisms with Domestic Greenhouse Gas Emissions Trading Schemes” (Paris: OECD/IEA, 2004) online: OECD <<http://www.oecd.org/dataoecd/38/8/32181359.pdf>>; The present study covers the linking of the ‘pure’ domestic trading schemes as well as the linking of project-based mechanisms as especially the CDM. So a combination of the different approaches is required here.

⁷³ See overview by Lutz Wicke, *Beyond Kyoto - A New Global Climate Certificate System* (Heidelberg: Springer 2005) [Wicke, *Beyond Kyoto*]; see also Robert R. Nordhaus & Kyle W. Danish, Assessing the options for designing a mandatory U.S. Greenhouse Gas reduction program (2005) 32 B.C. Envtl. Aff. L. Rev. 97, at. 111.

⁷⁴ Wicke, Lutz, *Umweltökonomie*, (4th edition) (Munich: Vahlen, 1993) p. 437, cited after *Wicke*, *Beyond Kyoto*, *supra* note 73, at p. 11.

⁷⁵ Cédric Philibert & Jonathan Pershing, “Considering the options: climate targets for all countries” (2001) 1 Climate Policy 211, [Philibert & Pershing] at 211.

⁷⁶ ECOFYS report, p. xiii and following.

⁷⁷ The ECOFYS approach also employ weighing criteria for the different criteria, putting most emphasis (3/9) respectively on ecological and political criteria, see Höhne, Niklas et al. (ECOFYS GmbH), “Evolution of commitments under the UNFCCC: involving newly industrialized economies and developing countries”, Environmental Research Of The Federal Ministry of the Environment, Nature Conservation and Nuclear Safety Research Report 201 41 255, UBA-FB 000412 (Berlin: Umweltbundesamt (Federal Environmental Agency), 2003), online: <<http://www.umweltdaten.de/publikationen/fpdf-l/2235.pdf>>, [ECOFYS report] p. vii.

B. Linking prospects with respect to existing emissions trading schemes

In the first part, I will describe the legal framework behind emissions trading schemes, and show the main legal obstacles for linking and make some proposals on how to address them.

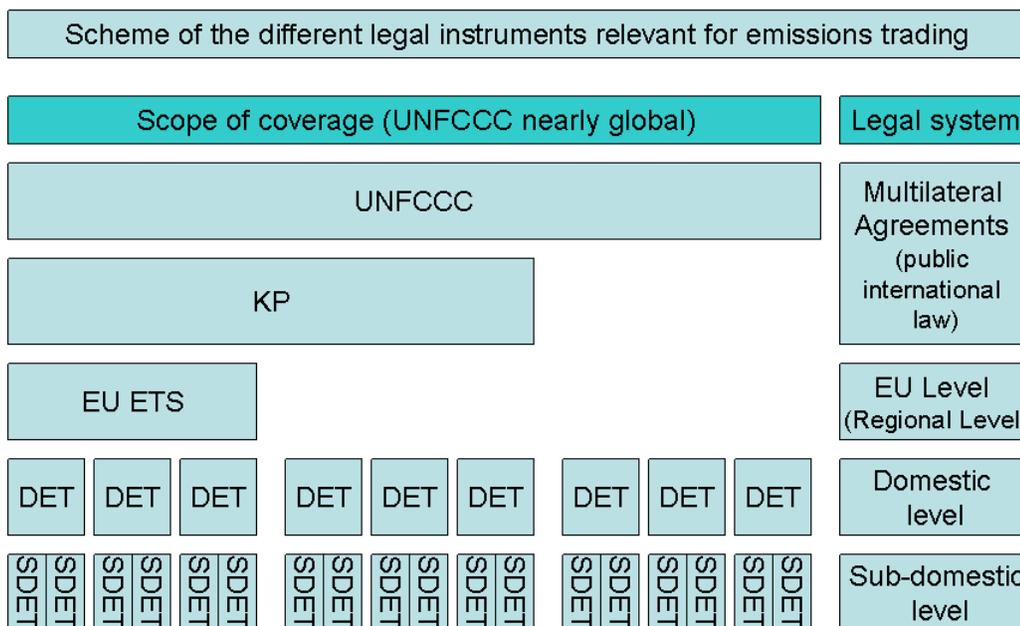
The second part will be dedicated to an examination of the impact of different design choices in existing emissions trading schemes on linking. For every design element, I will first outline the possible choices and their impact when schemes are linked and then proceed to a review of the design choices made by regulators of existing schemes. For every design element, I will also initially describe the Kyoto Protocol framework in order to point out what the central issues for the countries having ratified Kyoto would be to achieve linking as well as progress towards their Kyoto targets.

The EU ETS is a somewhat special case among the described schemes, as it is in some aspects already a linked system of currently 23 domestic emissions trading schemes. So some of the observations made on the EU ETS will be examined also with respect to the question what they mean for the ‘internal’ linking process the scheme includes.

I. Part 1: Legal Problems of linking different trading schemes

This section shall serve to clarify what levels of jurisdiction have an impact on emissions trading schemes with special focus on the interactions between the different systems. Public international law makes up for the first part of this examination: Linking emissions trading schemes has first to be viewed against the background of the UNFCCC and the Kyoto Protocol as the major multilateral instruments concerning global warming.

In a second part, the role of regional agreements, in particular EU law, as well as domestic and sub-domestic jurisdictions will be described, legal obstacles to linking will be named and solutions for overcoming them will be proposed. After this, I will describe the relevance of international legal commitment for the timeframes of linking and examined, what legal instruments are available for linking. In a concluding excursus, I will take a brief look at the WTO trade regime and its relationship with international emissions trading. We can already now state that linking is influenced by various levels of governance. The following chart shows these different levels in a very simplified way:



DET – Domestic Emissions Trading Scheme

SDET – Sub-domestic Emissions Trading Scheme

1. The UNFCCC and the Kyoto Protocol

The UN Framework Convention on Climate Change is the instrument of broadest international acceptance that relates to Climate Change.⁷⁸ The UNFCCC itself does not contain precise commitments for the parties, but rather sets out general principles on how to address Climate Change.⁷⁹ As these obligations are created by international law, they

⁷⁸ The ratification status is available online on UN Treaty website: <
<http://untreaty.un.org/ENGLISH/bible/englishinternetbible/partI/chapterXXVII/treaty32.asp>>.

⁷⁹ The main instruments are to be found in Article 3-6 of the UNFCCC. They are: Fairness, responsibility and leading by industrialized nations (Article 3 I UNFCCC); Consideration for the needs of developing countries (Article 3 II UNFCCC); Cost-Effectiveness ad sustainability (Article 3 III and IV UNFCCC); No restriction of trade (Article 3 V UNFCCC); Different technical obligations and regionalization (Article 4 I UNFCCC); Obligations on the part of industrialized nations (Art. 4 II UNFCCC); Transfer obligations (Art 4 III-X UNFCCC); Research, Education and Monitoring (Articles 5,6 and foll.).

are binding on the parties, which are states/international organizations, but not for individuals or legal persons.⁸⁰

The Kyoto Protocol agreed upon in 1997 at the third Conference of the Parties to the UNFCCC is an international agreement based on Article 17 of the UNFCCC.⁸¹ It entered into force on 16 February 2005 subsequent to its ratification by the Russian Federation.⁸²

The Protocol's Annex B contains reduction commitments for countries expressed in percentages of 1990 baseline emissions.⁸³ The Annex B countries are receiving a so-called Assigned Amount corresponding to their absolute allowed emissions. The Assigned Amount is expressed in terms of equivalents to one ton of CO₂ by so-called Assigned Amount Units AAUs, which form the base of the Kyoto unit system.⁸⁴ Several further unit types can be generated and are available for compliance by the parties: Removal units (RMUs) are issued by the respective party based on carbon sequestration (Art 3.3 and 3.4 KP).⁸⁵ The mechanism of Joint Implementation' leads to the creation of Emissions Reduction Units (ERUs) which are based on GHG reduction projects in another Annex B country and come into existence by the conversion of AAUs of the host country.⁸⁶ Certified Emission Reductions (CERs) are based on Clean Development Mechanism (CDM) reduction projects in non-Annex-B countries.⁸⁷ There have been two new CDM unit types created for land-use projects added by COP9⁸⁸: the tCER and the ICER, which take into account the dilution of certain reduction efforts over time.

⁸⁰ There is a trend, in particular in international criminal law, to emphasize the responsibility of the individual based on norms of international law. This, however presupposes that International agreement address individual behavior making prescriptions or proscriptions. In the agreements discussed here, we find no such provisions.

⁸¹ Sebastian Oberthür & Hermann E. Ott, *The Kyoto Protocol – International Climate Policy for the 21st Century* (Berlin, Heidelberg: Springer, 1999) [hereinafter Oberthür & Ott], p.1, 95.

⁸² The entry into force happened after ratification by 55 Parties representing 55 percent of the Greenhouse Gas emissions covered by the Protocols Annex B on a 1990 basis, see Article 3.1 Kyoto Protocol.

⁸³ There are three countries may increase their emissions, Australia, Iceland and Norway, as well as several countries that are allowed to stabilize their emissions, see Annex B Kyoto Protocol.

⁸⁴ UNFCCC COP Decision 19/CP.7, for a more detailed description of the unit system see *infra* p. 51.

⁸⁵ UNFCCC COP Decision 19/CP.7 paras. 25-28; Reference is also made to UNFCCC COP Decision 11/CP.7 with respect to Land-use, land-use change and forestry.

⁸⁶ Charlotte Streck, "Joint Implementation: History, Requirements and Challenges", in: Freestone & Streck, *supra* note 5, p. 107 [Streck, JI], at. 118.

⁸⁷ Kyoto Protocol, Art. 12.

⁸⁸ UNFCCC COP Decision 19/CP.9.

a) The Kyoto Protocol and International Emissions Trading (IET)

The Kyoto Protocol sets out a very basic international framework for emissions trading that goes beyond the flexible mechanisms just described. Article 17 of the Protocol allows for the establishment of International Emissions Trading (IET) between its Annex-I parties. What is not mentioned in this provision is trading by legal entities that are not states, but neither is it explicitly excluded.⁸⁹ Consequently, it has been assumed that with the Kyoto Protocol finally in force, Article 17 could become the basis of an international emissions trading regime.⁹⁰ Different proposals have been made on how to implement such a regime, but none has been realized.⁹¹

The provisions of the Protocol that relate to emissions trading and the “flexible mechanisms” have been further refined through the adoption of technical Annexes to the Protocol by Conference of the Parties in Marrakesh in 2001, commonly referred to as the Marrakesh Accords. However, with regard to emissions trading also the framework of the Marrakesh Accords remains rather general.⁹² The framework sets out definitions of the Kyoto units.⁹³ Then several conditions for the participation of countries in Article 17 emissions trading are defined:

1. “The country must be party to the Kyoto Protocol
2. Its assigned amount pursuant to Article 3, paragraphs 7 and 8 has been calculated and recorded in accordance with decision CP./XXX (Modalities for the accounting of assigned amounts)
3. It has in place a national system for the estimation of anthropogenic emissions by sources and removal by sinks, in accordance with Art. 5, paragraph 1 [...]
4. it has in place a national registry in accordance with Article 7 [...]

⁸⁹ Rutger de Witt Wijnen “Emissions trading under Article 17 of the Kyoto Protocol”, in: Freestone & Streck, *supra* note 5, [de Witt Wijnen] at p. 411.

⁹⁰ Erik Haites & Fiona Mullins, “Linking Domestic and Industry Greenhouse Gas Emissions Trading Systems” (2001), report prepared for EPRI, International energy agency (IEA) and International Emissions Trading Association,

Online: <<http://www.wbcsd.org/web/projects/cement/tf1/IETALinking.pdf>>.

[hereinafter Haites & Mullins], p.2.

⁹¹ Preceding the Marrakesh Accords of 2001, there were substantially different proposals, the major ones from a group of countries consisting of Australia, Canada, Iceland, Japan, New Zealand, Norway, Russia and the US, from the EU, and from the G-77, see online on the website of the International Institute for sustainable development, <<http://www.iisd.ca/climate/ba/trading.html>>.

⁹² UNFCCC COP Decision 18/CP.7.

⁹³ In particular in the Decisions on JI and CDM, UNFCCC COP Decision 16/CP.7 and UNFCCC Decision 17/CP.7.

5. It has submitted annually the most recent required inventory in accordance with Article 5, paragraph 2 and Article 7, paragraph 1 [quality assessment]
6. It submits additional information according to Article 7, paragraph 1 [...] and makes any additions to, or subtractions from, assigned amount [further rules]”

The decision further contains certain procedural rules about the cases in which a party is to be considered to meet these requirements.⁹⁴ A Compliance Committee of the Protocol was recently established.⁹⁵ Its Enforcement Branch is in charge of making determinations on these questions.⁹⁶ A publicly accessible list of eligible and suspended parties is to be maintained by the Secretariat.⁹⁷ The decision further emphasizes the responsibility of the parties for their transfers of Kyoto units and refers to the authorization of legal entities for participation in emissions trading by saying that such participation does not relieve parties from their responsibility for their reduction obligations.⁹⁸ The ability of legal entities to trade therefore depends on the eligibility of the authorizing party for trading. The authorization of entities is to be recorded by the parties and the list of authorized entities must be made available to the secretariat and the public through the national registry.⁹⁹ Not only AAUs but all Kyoto units can be transferred in accordance with Article 17.¹⁰⁰

So the Marrakesh Accords stipulate the ability of authorized legal persons to transfer any type of Kyoto unit to foreign countries that are parties to the Protocol or to legal entities authorized by such countries. The provisions on the responsibility of the respective party will force the parties to create rules requiring the units held by a private legal entity to be available for international compliance. Problems in this context may arise in relation to the so-called Commitment Period Reserve¹⁰¹ and the so-called supplementarity provisions of the Protocol.¹⁰²

⁹⁴ UNFCCC COP Decision CP 18/7 paras. 3(a) and (b).

⁹⁵ UNFCCC COP Decision 27/CMP.1.

⁹⁶ UNFCCC COP Decision 18/CP.7, Annex para. 3(b).

⁹⁷ UNFCCC COP Decision 18/CP.7 – Annex para. 4.

⁹⁸ UNFCCC COP Decision 18/CP.7 Annex para. 5.

⁹⁹ UNFCCC COP Decision 18/CP.7, Annex para. 4.

¹⁰⁰ UNFCCC COP Decision 18/CP.7, Annex, para. 2.

¹⁰¹ UNFCCC COP Decision 18/CP.7, Annex, para. 6, see on these problems *infra* p. 24.

¹⁰² UNFCCC COP Decision 15/CP.7; Another question is whether a party can only give authorizations to legal entities based and registered in its own territory or to any legal entity, The language of the Marrakesh Accords suggests that the nationality of the legal entity is without importance, UNFCCC COP Decision 18/CP.7, Annex, para. 5, see also De Witt Wijnen, *supra* note 89, at p. 412.

It should be noted that in addition that Article 17 governs all units types created by the Kyoto Protocol, but is at the same time restricted to these units.¹⁰³ Domestic trading schemes must therefore be based on the Kyoto accounting units if they shall allow for Article 17 trading by legal entities. This would suggest a scheme design were Kyoto units are available for entity compliance on the domestic level as well.¹⁰⁴ Should countries choose to adopt a different unit system domestically or regionally, which seems bound to happen with respect to some countries,¹⁰⁵ Article 17 says nothing about the interchangeability of such units.¹⁰⁶ Consequently we can say that the hope that most problems with linking would be resolved from the onset of the first Kyoto Commitment Period in 2008 came a little too early.¹⁰⁷ But it can still be stated that the Kyoto unit framework may indeed be used to facilitate linking between Annex-B parties, but that the responsibility for establishing proper links rather lies on the regional and domestic level.

b) Enforcement under the Kyoto Protocol

The credibility of the Kyoto units strongly depends on the strength of the enforcement mechanisms of the Protocol. Under the Kyoto Protocol, the Compliance Committee consists of a Facilitative Branch and an Enforcement Branch.¹⁰⁸ The Enforcement Branch is in charge of determining violations of the Protocol's reduction commitments and their consequences. Its determinations "shall be aimed at the restoration of compliance to ensure environmental integrity, and shall provide for an incentive to comply."¹⁰⁹ The moment of truth for the Kyoto Protocol Compliance Committee will come when compliance for the first commitment period has to be assessed. But given the actions of some parties in the recent past, it is rather unlikely that enforcement successes will be very strong.¹¹⁰ Furthermore, the dispute settlement system of the Protocol seems rather

¹⁰³ De Witt Wijnen, *supra* note 89, at p. 411.

¹⁰⁴ See *infra* p. 24.

¹⁰⁵ See *infra* p. 51.

¹⁰⁶ De Witt Wijnen, *supra* note 89, at p. 411.

¹⁰⁷ Haites & Mullins, *supra* note 90, p. 2, who obviously assume that Kyoto units would be the only traded units in a Kyoto-wide emissions trading market.

¹⁰⁸ Kyoto Protocol MOP Decision 27/CMP.1.

¹⁰⁹ Kyoto Protocol MOP Decision 27/CMP.1 Annex para V.6.

¹¹⁰ See for example Canada, Minister of the Environment Rona Ambrose, Speech "A Breath of Fresh Air: Made in Canada Solutions to Meet Canada's Environmental Challenges" (31 March 2006), online: Environment Canada <http://www.ec.gc.ca/minister/speeches/2006/060331_s_e.htm>.

ill-designed to allow for enforcement by the parties themselves.¹¹¹ Successful enforcement will, however, be required, if Kyoto units are to become the basis of linked entity level trading schemes.

2. The EU level

In European Community Law, the framework of emissions trading is formed by directive 2003/87¹¹² which was amended once to include the JI and CDM mechanisms.¹¹³ The Directive is based on the provisions on environmental protection in Article 175.1 EC treaty.¹¹⁴ A directive is a legal instrument operating at the EC level that is binding to the member states with respect to its objectives, not with respect to the means of implementation. Nevertheless, Directives often contain detailed provisions that do not leave much discretion for implementation to the member states. If a member state is in violation of secondary community law¹¹⁵, the ECJ can determine such violation and imposes fines on the member state if compliance is not achieved after the ruling.¹¹⁶ European Community Law is thus one of the few multilateral treaties with a truly effective dispute settlement and enforcement mechanism that has proven to have teeth in the past. Nevertheless, the EU ETS depends on implementation by the member states and leaves important decisions with respect to the scheme to them.¹¹⁷

In our case, the limited powers with respect to environmental regulation vested upon the European jurisdiction in the EC treaty limit the amount of details that can be addressed by the directive.¹¹⁸ Many detail are therefore left to the member states, such as

¹¹¹ Article 19 of the Kyoto Protocol refers to the UNFCCC which comes with a dispute settlement system that relies on reference of disputes to the ICJ and/or Arbitration, see Article 14.2 UNFCCC.

¹¹² EC Directive 2003/87. see *supra* note 17.

¹¹³ EC, Directive 2004/101/EC of the European Parliament and of the council of 27 October 2004 amending directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the community, in respect of the Kyoto Protocol's project mechanisms (text with EEA relevance) [2004] O.J. L. 338/18 [EC Directive 2004/101].

¹¹⁴ *Ibid.*, preamble.

¹¹⁵ Which includes directives, regulations and community decisions, Art. 249 EC treaty.

¹¹⁶ EC treaty, Artt. 226, 228.

¹¹⁷ EC Directive 2003/87, *supra* note 17.

¹¹⁸ Kurkowski, *supra* note 66, at p. 708; According to Art. 175.1 EC Treaty, which is at the base of the current legislation, the EC can act to pursue the environmental objectives set out by Article 174. Art. 175.1 only requires a qualified majority. It is, however, restrained by the language of Article 175.2 EC Treaty, which allows the Community to take environmental measures of a "primarily fiscal nature" or "measures significantly affecting a Member State's choice between different energy sources and the general structure

the establishment of registries¹¹⁹, of a formal penalty system¹²⁰, monitoring and verification of emissions¹²¹ and in particular the establishment of the total number of allowances to be allocated as well as the actual allocation of allowances to installations.¹²² The European level merely sets a framework of rules and reserves itself certain powers of control over member states' actions.¹²³ Links with other schemes are advocated within the directive¹²⁴ and the EC (via Art. 300 EC) has the power to negotiate agreements with third countries in all external matters relating to the internal competences it has made use of.¹²⁵

3. The domestic level

The units created in emissions trading regimes occupy a position between private and public rights¹²⁶ and have been described as 'regulatory rights'.¹²⁷

Public law: On the domestic level, emissions trading requires, first, an integration of the permit/credit system into domestic environmental law, which in most countries is considered a part of administrative law. The right to emit must be made dependent on the holding of emissions permits/credits by the emitting entity and domestic law must provide for the actual monitoring and verification of emissions, as well as for fines for non-compliance. The accounting for and taxation of units are equally part of domestic administrative law and have to be addressed.¹²⁸ From the perspective of emissions rights as public allowances, the allowances in any scheme are only valid, as long as they are recognized for domestic compliance purposes. In which cases this recognition is granted

of its energy supply.”; this head of power, requires unanimity in the Council and has therefore not been employed to set up the EU ETS.

¹¹⁹ EC Directive 2003/87, see *supra* note 17, Art. 19.

¹²⁰ *Ibid.*, Art. 16: the level of the penalties is, however, defined in the Directive.

¹²¹ *Ibid.*, Artt. 14,15.

¹²² *Ibid.*, Artt. 9-11.

¹²³ *Ibid.*, Art 9.3: the EC Commission can reject a National Allocation Plan; Art. 19.3: a standardized system of registries is to be established by a European regulation; Art. 20.1 regulates an independent transaction log of the Community with a Central Administrator; Art. 21 says that member states have yearly reporting obligations towards the Commission; Art. 30 contains the outline of a review to be completed by the Commission by mid-2006; and Art. 31 constitutes an obligation of the member states to report on the details of their implementation.

¹²⁴ EC Directive 2003/87, see *supra* note 17, Art. 25.

¹²⁵ E.C.J., *Legal Opinion 1/94*, [1994] E.C.R. I-5267, at XIV.

¹²⁶ Wemaere & Streck, *supra* note 210, at p. 44.

¹²⁷ Wemaere & Streck, *supra* note 210, at p. 53.

¹²⁸ Casamento, Robert, “Accounting for and Taxation of Emission Allowances and Credits”, in: Freestone & Streck, *supra* note 5, p. 55 [Casamento] at p. 68.

to allowances from other schemes is at the very heart of the negotiation process towards linking and largely determined by the other factors discussed above.

Private law: A second area of domestic law that must contribute to emissions trading is private law: the exchange of emission permits on the company level must be governed by the domestic law of obligations (as it is similar to a sale of goods). These rights are linked to potentially profitable economic activity and transferable and therefore have market value, which makes them fall under the protection of property in many states.¹²⁹ In addition, others can be excluded from interference with such rights, which is another defining feature of property rights.¹³⁰ What is protected as property here is not so much a 'right in the atmosphere' or a 'right to pollute',¹³¹ but rather the ownership and market value of the allowances.¹³² The domestic law of property rights transfer will govern the actual transfer of the permits. Transactions between schemes, or even within schemes, as in the EU ETS, become a matter of private international law, but not an atypical matter.

Constitutional law: The notion of property rights leads us to the third area of domestic law playing a role in emissions trading: constitutional law. In most domestic legal systems, there is a constitutional protection of property rights. Often times these are defined by a substantive standard and can potentially encompass every asset that has economic value,¹³³ or constitutes a government benefit.¹³⁴ It can in other words also be defined as a right created by regulation in the context of a constitution.¹³⁵ The wording of provisions describing emission rights may try to deny the character of a property right,

¹²⁹ *Supra*, p. 24.

¹³⁰ Wemaere & Streck, *supra* note 210, at p. 52.

¹³¹ Although administrative law may grant some protection of confidence in the validity of allowances after they were granted, as this is the case in German administrative law (Articles 48,49 *Verwaltungsverfahrensgesetz*).

¹³² Woerdman, *supra* note 43, at p. 366; Wemaere & Streck, *supra* note 210, at p.39.

¹³³ Donald R. Kommers, *The Constitutional Jurisprudence of the Federal Republic of Germany* (Durham: Duke University Press, 1997), at p.251; see also Wicke, *Beyond Kyoto*, *supra* note 73, at p. 274; for the Canadian context, see generally Peter W. Hogg, *Constitutional Law of Canada* (2nd Ed.) (Scarborough, Ont.: Thomson Carswell, 2005), at p. 527, who emphasizes the relationship between property and civil liberties in the economic context.

¹³⁴ *Board of Regents of State Colleges v. Roth* (1972) 408 U.S. 564, 92 S.Ct. 2701 (1972); John E. Nowak & Ronald D. Rotunda, *Principles of Constitutional Law* (2nd Ed) (St. Paul: Thomson West, 2005), p.335.

¹³⁵ Donald R. Kommers, *The Constitutional Jurisprudence of the Federal Republic of Germany* (Durham: Duke University Press, 1997), at p. 254.

the constitutional view on it may affirm that very character.¹³⁶ As a consequence, emission rights can, once granted, not be made invalid or discounted without constitutional justification and compensation. A domestic regulator bound by such guarantees would not easily give up a scheme or devalue the units already allocated to entities.¹³⁷ There are nevertheless, as *Victor* points out, concerns with respect to the enforcement and protections of property rights in economies in transition.¹³⁸ Should one scheme be given up, all units already traded from it into other, still existing markets can without problems still receive full recognition for compliance in these markets as long as the respective emissions allowances or credits are linked to actual reductions.¹³⁹

The international dimension of units: Opposed to this, all units which are created for compliance in international systems solely are assets defined by public international law, and not by the domestic public law or property law. They sure cannot be defined as ‘state property’ of the states that are holding them.¹⁴⁰ However, this does not keep states from acting as temporary holders of credits coming from or going to private parties. The legal regime is just not the same, as ‘property rights’ or ‘public law allowances’ do not play a role in the terminology of public international law. A domestic regulator can also decide to define units that represent both a domestic allowance and international units at the same time.¹⁴¹ In that case, the legal consequences of both regimes apply in parallel with respect to such a unit. It can be imagined as a two-sided coin.

There are relationships between the two sides of the coin, as international compliance requirements may call for some restrictions of entity trading: Parties are obliged to keep in their registry a so-called commitment reserve that equals 90 percent of their initial

¹³⁶See for example para. 403(f) of the US *Clean Air Act*, *supra* note 30 which concerns the legal nature of emissions rights in the federal SOx/NOx trading program, wherein the regulator explicitly states: “[...] such allowance does not constitute a property right[.]”, at 42 U.S.C. s/s 7651b.

¹³⁷ Such constitutional protection should even be granted in spite of many schemes trying to avoid the creation of property rights by emissions trading schemes. This issue nevertheless deserves further consideration, in particular it has to be asked if a state could argue that it relieved they emitters from a regulatory burden at the same time that it gave up its trading scheme, compare on the German situation Wicke, *Beyond Kyoto*, *supra* note 73, at p. 274; This, however, would not take into account allowances held by brokers or other non-emitters. Offset credits should lead to additional problems in this respect.

¹³⁸ *Victor*, *supra* note 68, at p. 67.

¹³⁹ A risk can only arise here, when a scheme breaks down subsequent to a period of ‘overselling’ into other schemes and no or very lax regulation of GHG emissions follows the breakdown of the scheme.

¹⁴⁰ Compare the assessment of the WTO status of Kyoto units by Wemaere & Streck, *supra* note 210, at p. 46, compare also De Witt Wijnen, *supra* note 49, at p. 410, who describes the difference between private party trades and state-to-state transfers.

¹⁴¹ As for example the EU ETS is planning to do, see *infra* p. 55.

assigned amount in any of the Kyoto units.¹⁴² In addition, the Kyoto Protocol prescribes the use of emissions trading and the flexible mechanisms to be supplemental to domestic actions.¹⁴³ Supplementarity is addressed by the rules on the flexible mechanisms agreed upon in the Marrakesh Accords and has been interpreted in a qualitative way.¹⁴⁴

Examples of schemes rooted in a domestic legal system: The Canadian scheme only got developed to the stage of different government plans. There were further a notice of intent to regulate¹⁴⁵ and Drafting Instructions for Cross-Cutting provisions of Large Final Emitter Regulations¹⁴⁶ published under the liberal government. Regulations would have been based on parts 5 and 11 of the CEPA¹⁴⁷, the trading scheme in particular on Sections 322 and 326 of the CEPA¹⁴⁸ and were intended to be sector specific¹⁴⁹, but final regulation has never taken place.¹⁵⁰ Without specifying the private law status of allowances, the Canadian government was envisaging the actual trading to be taking place through private brokers or exchanges.¹⁵¹ As the LFE system never became operational, the constitutional status of emission units was not tested in Canadian courts.

¹⁴² An exception is contained in UNFCCC COP Decision 18/CP.7, para. 10 - ERUs which were issued under the Article 6 verification procedure by the Article 6 supervisory committee are transferable regardless of that rule.

¹⁴³ Articles 6 (1) (d), 12 (2), and Article 17 Kyoto Protocol

¹⁴⁴ UNFCCC COP Decision 15/CP.7, preamble.

¹⁴⁵ Canada, Government of Canada, *Notice of Intent to Regulate Greenhouse Gas Emissions by Large Final Emitters* C. Gaz. 2001. I. 2489, online: Canada Gazette
<<http://canadagazette.gc.ca/partI/2005/20050716/pdf/g1-13929.pdf>>.

¹⁴⁶ Canada, Environment Canada, *Drafting Instructions Cross-Cutting Provisions Large Final Emitters Regulations* (November 2005), Online:
<http://www.ec.gc.ca/CEPARRegistry/documents/part/LFE_drft_inst/Crosscutting_for_public_comment.pdf> [Canada, Instructions Cross-cutting Provisions].

¹⁴⁷ Canada, Government of Canada, *Notice of Intent to Regulate Greenhouse Gas Emissions by Large Final Emitters* C. Gaz. 2001. I. 2489, online: Canada Gazette
<<http://canadagazette.gc.ca/partI/2005/20050716/pdf/g1-13929.pdf>> [Canada, Notice of Intent] introduction.

¹⁴⁸ Which read: “322. The Minister may establish guidelines, programs or other measures for the development and use of economic instruments and market-based approaches to further the purposes of this Act, respecting systems relating to (a) deposits and refunds: and (b) tradeable units.”; Section 326 contains the power of the Governor General to regulate.

¹⁴⁹ Schedule 2 of the Instructions Cross-cutting provisions, *supra* note 146.

¹⁵⁰ It remains unclear if there is an intention of the current conservative government to pursue the project of an emissions trading scheme at all, see *supra* p. 15.

¹⁵¹ The government only wanted to establish a ‘tracking system’ surveying current and previous ownership of credits in order to prevent the multiple use of credits, see Offset system for Greenhouse Gases, Overview Paper, p. 6.

Norway has enacted a Greenhouse Gas Emission Trading Act in 2004,¹⁵² which is supposed to be complemented by royal regulations.¹⁵³ It sets up an allowance scheme that is binding for specified final emitters and has started to operate in 2005.¹⁵⁴ The private law dimension is not addressed by the Act by free transferability of allowances is mentioned in the Act.¹⁵⁵

Private systems: Given that on fundamental characteristics of emissions trading regimes is the issuance of allowances to emit, it seems natural that emissions trading regimes are run publicly by regional organizations, countries, states or provinces. Nevertheless, also private systems on a contractual basis are conceivable and could be capable of linking. In private schemes, emissions units are representing rights that are contractual in nature, and therefore entirely private, but enforceable through state courts. The Chicago Climate exchange is a scheme based on membership by industrial emitters, municipalities, and institutions.¹⁵⁶ It is organized as an incorporated entity. Membership is based on contracts with this entity and is entirely voluntary.

4. The sub-domestic level in federal states

In federal states, the jurisdiction over the areas of law described above can be with different levels of government, as for example the federal government and the provinces in Canada, the federal government and the states in the US or the Bund and the Länder in Germany. Federal systems tend to complicate the process of setting up emissions trading systems.¹⁵⁷ Challenges can already arise on that level, as in some countries, sub-federal jurisdictions will have the powers necessary to set up their own ETS. This issue raises the question of linkage between such a scheme and a federal scheme and, more prominently for the possibilities to link into schemes located in other countries. Problems with respect

¹⁵² *Act relating to greenhouse gas emission allowance trading and the duty to surrender emission allowances*, Act of 17 December 2004 No.99, online: Norwegian Ministry of the Environment <<http://www.e-norway.no/md/english/doc/legislation/acts/022051-200015/dok-bn.html>> [Greenhouse Gas Emissions Trading Act].

¹⁵³ See for example para 2 and 3 of the greenhouse gas emissions trading act.

¹⁵⁴ Greenhouse gas emissions trading act, *supra* note 152, at para. 4.

¹⁵⁵ Greenhouse gas emissions trading act, *supra* note 152, at para. 12

¹⁵⁶ See online: Chicago Climate Exchange

<http://www.chicagoclimatex.com/about/pdf/CCX_Corp_Overview_2005.pdf>; as well as <<http://www.chicagoclimatex.com/about/members.html>>.

¹⁵⁷ Markus Gehring, “Systemic Issues in Federal Implementations of Emissions Trading Schemes” [2005] (Presentation given at the conference “Strengthening Climate Cooperation, Compliance & Coherence”, Montreal, Canada: December 2006) [unpublished, on file with the author].

to linking can arise, if sub-domestic jurisdictions setting up schemes are for constitutional reasons not capable of concluding binding international agreements, i.e. if they are lacking the ‘treaty power’. If several states in a federal state want to establish linked trading schemes among them, they may also face constitutional problems.

The RGGI scheme is very instructive as to these pitfalls for sub-domestic schemes. First, as previously mentioned, RGGI is an initiative of different US states. Consequently, there is no central scheme regulator. The states involved in RGGI responded to this problem by starting a cooperative process between the states involving stakeholders¹⁵⁸ based on a (non-binding) memorandum of understanding (MOU) between the involved states.¹⁵⁹ Based on the MOU, a Model Rule was developed. It is to be adopted as binding legislation in the respective states.¹⁶⁰ The scheme is scheduled to start on January 1st, 2009. This process does, however, not automatically lead to an outcome that allows for interstate allowance trading,¹⁶¹ although the RGGI states emphasize this as a major goal of their program.¹⁶² In the current raw form, RGGI is a harmonized system of several parallel, but not interlinked emissions trading schemes. It is intended to achieve the goal of interstate trading by having states refer to a common allowance tracking system,¹⁶³ in which they would be administering accounts for emitters. The RGGI states have further agreed to establish a regional organization in the form of a private law association, which will have assisting functions in cooperation, co-ordination and representation of RGGI

¹⁵⁸ This process started in April 2003 by an initiative of George E. Pataki, Governor of New York, see online: RGGI <<http://www.rggi.org/about.htm>>.

¹⁵⁹ Regional Greenhouse Gas Initiative, *Memorandum of Understanding* [2005], online: Regional Greenhouse Gas Initiative <http://www.rggi.org/docs/mou_12_20_05.pdf>, as amended by Regional Greenhouse Gas Initiative, *Amendment to Memorandum of Understanding* [2006], Online: Online: Regional Greenhouse Gas Initiative <http://www.rggi.org/docs/mou_8_8_06.pdf> [RGGI MOU].

¹⁶⁰ Regional Greenhouse Gas Initiative, *Model Rule (8/15/2006)* [2006], online: Regional Greenhouse Gas Initiative <http://www.rggi.org/docs/model_rule_8_15_06.pdf> [RGGI Model Rule].

¹⁶¹ The whole RGGI architecture is multiplied in every participating state, but does contain direct references to interstate linkages.

¹⁶² See RGGI homepage, online: <<http://www.rggi.org/goals.htm>>.

¹⁶³ RGGI Model Rule, see *supra* note 160, XX-1.2 (n), the definition of ‘CO₂ allowance tracking system’ does only refer to the states ‘using’ an allowance tracking system, not creating one of their own. The Eastern Climate Registry is likely to be used as the host of this tracking system, see online: <<http://www.easternclimateregistry.org/registriesbackground.html>>;

The Eastern Climate Registry is managed by The Northeast States for Coordinated Air Use Management (NESCAUM), a non-profit association of state agencies dealing with air quality in the US Northeast, see online: <<http://www.nescaum.org/about-us/overview>>.

towards third parties.¹⁶⁴ This is a concession is due to the prohibition against treaty-making by and between states in the US Constitution.¹⁶⁵ With regard to the state-level enforcement, RGGI is necessarily very weakly armed. The MOU is ultimately legally non-binding in nature, as US States are unable to conclude binding agreements among them.¹⁶⁶ The political stakes of defaulting are nevertheless rather high.

A second potential constitutional threat to RGGI may be the ‘dormant commerce clause’,¹⁶⁷ in case that its efforts to contain emissions leakage¹⁶⁸ are seen as affecting interstate commerce.¹⁶⁹ Third, the conclusion of treaties with other countries by states is excluded by the U.S. constitution.¹⁷⁰

5. Main legal challenges to linking

As we have seen, the UNFCCC and the Kyoto Protocol are binding under international law for all countries that are parties to them. The domestic schemes of countries with reduction commitments could mirror the Kyoto system to allow for use of its flexible mechanisms and unit trading with other parties, also for legal entities. But there is no legal obligation to do so, as compliance can be achieved by instruments freely chosen by a party. Emissions trading schemes are only one of many options, and in fact all of them will have to be backed by other measures aimed at GHG abatement in the non-trading sectors (NTS). Between Kyoto parties, linking of emissions trading schemes

¹⁶⁴ MOU para. 4, the Regional organization will have the status of a non-profit entity incorporated in the state of New York.

¹⁶⁵ U.S. Const. Art. II, § 2 contains the power of the President to make treaties, the tenth amendment points out, that this states have only the powers that are not assigned to the federal level, compare *Missouri v. Holland*, I. 252 U.S. 416 (1920); U.S. Const. Art. I, § 10, explicitly prohibits states to “enter into any Treaty, Alliance, or Confederation”

¹⁶⁶ *Supra* page 78.

¹⁶⁷ The ‘commerce clause’ in U.S. Const., Art. I, § 8 gives the power to regulate interstate commerce to the federal level. This provision has been interpreted as also extending to regulations of commerce by states in areas wherein no federal legislation exists, if the state regulation in general discriminates against interstate commerce in purpose or effect, compare John E. Nowak & Ronald D. Rotunda, *Principles of Constitutional Law* (2nd Ed) (St. Paul: Thomson West, 2005); the concept originated in *Willson v. Black Bird Creek Marsh Co.*, 27 U.S. (2 Pet.) 245, 252 (1829).

¹⁶⁸ The RGGI scheme is currently planned to only cover electricity generators, which makes it particularly susceptible to emissions leakages as electricity grids are considerably interconnected in the North East of the US, RGGI MOU, para 6.A.

¹⁶⁹ See presentation by Fred Zalcman, at Workshop on Imports and Emissions Leakage *In Support of the Regional Greenhouse Gas Initiative*, Vermont School of Law, June 15-16, 2006, online: <www.rggi.org/docs/zalcman.ppt>.

¹⁷⁰ See *supra* note 165, see further on potential remedies p. 32.

will most likely not cause many legal problems, but problems based on design choices may remain.¹⁷¹

The linking situation becomes more problematic when schemes without a Kyoto commitment in the background are involved, if jurisdictions setting up schemes are legally not capable of concluding binding international agreements, which can be the case between domestic and sub-domestic schemes and when private actors are involved. The resulting challenge is to install legal gateways between schemes of parties with different international commitments (7), rooted in domestic and sub-domestic jurisdictions (8) and based on public and private initiatives (9).

6. Legal gateways addressing different international commitments: Kyoto-and Non-Kyoto schemes

This section talks about the transfer of domestically generated units, with exception of the CDM. Every transaction of domestic units by a Kyoto party to a foreign party has to be ‘backed up’ by AAUs be it by a transfer, if another Annex B states is involved, or by a cancellation, if the other party is not an Annex B country or not a party to the Protocol. In case of an export of units to such a country, the Annex-B country has to merely cancel an AAU from its national registry. If purely ‘domestic currency’ is exported, the cancellation would be environmentally sound, but is *de iure* not required, as such transfers are exclusively governed by the domestic law behind each trading scheme. In case of an ‘import’ of credits from such a scheme, no transfer of AAUs will take place, as the non-Annex-B country does not have an Assigned Amount of its own. This, again, does not apply if states decide to authorize the transfer of AAUs by private entities. But it would still not make any non-Annex-B Party a holder of AAUs. AAUs account for the total amount of emissions allowed to a party, and consequently cover all sectors of the economy, including the trading scheme as well as the non-trading sector (NTS). Consequently, if credits are imported from non-Kyoto schemes, the reductions/emissions they represent cannot be accounted for in the trading sector and have to be made up for in the NTS, if a Party is to stick to its overall commitment.

¹⁷¹ See *infra* p. 44 and following.

The purchase of units from a non-Annex-B party by non-Kyoto scheme will only be attractive if it is backed up by Kyoto units. Even if a country is not represented in Annex B, it could deliver AAUs or other Kyoto units via other countries or private intermediaries. The only remaining question then is, whether such a deal is economically feasible for the selling scheme, as it will have to bear the additional cost of acquiring Kyoto units and arranging the deal via intermediaries.

Finally, there is the possibility that units from a non-Kyoto jurisdiction are forced into a Kyoto scheme via the WTO. This scenario has been discussed above¹⁷² and seems rather small. Should the WTO DSB nevertheless take such an approach, the international governance model of the Kyoto Protocol would be fundamentally put into question.

7. Legal gateways to and from sub-domestic schemes

As already stated, constitutional law in many states does not allow sub-national jurisdictions to conclude international agreements governing the mutual recognition of units.¹⁷³

RGGI provides us with an example on how some degree of linking can be achieved through the issuance of credits in the sub-domestic scheme which mirrors the cancellation of credits from outside the scheme. The following paragraph contains the only reference in the RGGI model rule to linking:

“(b) *Eligible CO2 emissions credit retirements.* The REGULATORY AGENCY may award CO2 offset allowances to the sponsor of a CO2 emissions credit retirement that has satisfied all the applicable requirements of this Subpart.

(1) CO2 emissions credit retirements include the permanent retirement of greenhouse gas allowances or credits issued pursuant to any governmental mandatory carbon constraining program outside the United States that places a specific tonnage limit on greenhouse gas emissions, or certified greenhouse gas emissions reduction credits issued pursuant to the United Nations Framework Convention on Climate Change (UNFCCC) or protocols adopted through the UNFCCC process.”¹⁷⁴

¹⁷² See *supra* p. 41.

¹⁷³ See *supra* p. 28.

¹⁷⁴ RGGI Model Rule, *supra* note 160, XX-3 2.b(1).

The respective regulatory agencies may, however, only award credits for retirements of this kind after a so-called stage two trigger event.¹⁷⁵ So the RGGI scheme will not allow for the ‘import’ of foreign credits but only for their conversion into RGGI offset credits. This avoids the constitutional pitfall of having to enter into agreements with other states on the mutual recognition of credits. The arrangements with respect to the retirement of foreign credits are entirely left to the private sponsors involved in the transaction. Provisions on the export of credits are entirely missing, which reflects that the linking provisions in the RGGI scheme are constructed as a safety mechanism in case of high prices and conceive the scheme exclusively as a buyer of credits on the international markets. The export of credits, however could technically occur where another scheme had provisions similar to those of RGGI, i.e. would award domestic allowances/credits to sponsors of credit retirements in RGGI.¹⁷⁶

This form of linking should, however, come with rather high transaction costs and administrative effort, as the cancellation of credits has to be proven and credits have to be reissued. Exportation of credits could technically work the same way.¹⁷⁷

Another approach may be to have the federal level of the country in which sub-domestic trading exists conclude a framework agreement with the regulator of the other scheme in order to allow the sub-domestic scheme’s regulator to conclude an agreement for trading of sub-domestically generated credits. This requires, however, that the respective federal legislator takes a favorable approach to the issue of greenhouse gas abatement and assumes international liability for the obligations the sub-domestic scheme incurs.. At least in the case of the US federal administration, which currently hosts the main examples of sub-domestic trading schemes¹⁷⁸, this must be doubted.¹⁷⁹

¹⁷⁵ This is defined as a twelve month-period during which the average allowance price equals or exceeds a threshold price of USD 10 per allowance, *Ibid*, XX-6.5 (a)(3)(iii), *Ibid*, XX-1.2. (bd) and (be), see *infra* p. 57.

¹⁷⁶ Credit retirements are possible in the RGGI scheme, see RGGI Model Rule, *supra* note 160, XX-10.2 (ac), as well as XX-10.3 (b)(1), which names foreign and Kyoto credits only as one possible ‘currency’ that can be retired.

¹⁷⁷ See *supra* p. 31.

¹⁷⁸ RGGI is the most prominent example, but recently also California, which is the world’s number 6 (?) in terms of GHG emissions, has announced its intention to set up a scheme.

¹⁷⁹ See a recent press release from the White House which does not address the RGGI efforts, US, Government, press release, „Setting the Record Straight: President Bush's Strong Record of Addressing Climate Change” (11 July 2006), online: White House <<http://www.whitehouse.gov/news/releases/2006/07/20060711-7.html>>.

Another complicating aspect of linking domestic and sub-domestic schemes can be different Kyoto commitments of the respective countries.¹⁸⁰ If all countries involved in linking have Kyoto commitment, some coordination between the federal and sub-domestic level may be required as to the proper accounting for the Kyoto targets and underlying transfers of AAUs and other units. This could equally be addressed in a framework agreement as described above. It would likely also require some coordination between the federal regulator and its sub-entities. If one of the respective countries does not have a Kyoto commitment, linking also faces the problems described in the previous paragraph.

8. Legal gateways between public and private schemes

This paragraph is dealing with gateways between private and public trading schemes involving some sort of limitation commitments for legal entities, but not with the participation of private entities in project-based mechanisms like the CDM.¹⁸¹ A central issue in the comparison of public and private trading schemes is the incentives to participate and comply in them. The incentive to comply for legal entities in a public system comes from the capacity of the public system to enforce the reduction obligations via administrative instruments such as fines or a reduction in emission right allocation in following years. In a private system, the incentive to comply flows from the contract between the emitter and the trading scheme allowing for a contractual claim in money against the emitter in the case of non-compliance. An additional incentive can be seen in the loss of public standing if the lack of compliance becomes widely known. Enforcement in private law courts is required, making enforcement an issue governed by private law, potentially private international law. Both public and private systems provide thus incentives to comply to the entities involved in them. But it must be kept in mind that no entity is obliged to participate in a private scheme in the first place.¹⁸²

¹⁸⁰ See *supra* p. 31, the problems occurring here should be identical to those described already.

¹⁸¹ Private legal entities may participate in the CDM credit generation process as Designated Operational Entities (DOEs) responsible for checking the completeness of methodologies, validating project activity, formally requesting project registration and verifying and certifying emissions reductions, see UNFCCC COP Decision 17/CP.7; they can also, assuming their authorization by a Party to the Protocol, participate as Project Participants, Art. 12.9 Kyoto Protocol and UNFCCC Decision 17/CP.7, which propose and implement a specific project under the CDM rules.

¹⁸² See *infra* p. 50.

From a legal perspective, privately created units are irrelevant for Kyoto commitments. They can, if the reductions in the private scheme are achieved outside the framework of a domestic emissions trading scheme, nevertheless serve to lower a country's aggregate emissions.

If privately created units are to be imported into a public scheme, several ways are conceivable: recognition as domestic offset credits in a public scheme is possible, but would require harmonization of the credit generation methodologies with the Kyoto framework or domestic framework, depending on whether the country is an Annex-B party to the Kyoto Protocol.¹⁸³ The entity managing the installation where the reduction is claimed would have to take on comparable rules on monitoring, reporting and verification as those that apply to the trading scheme, and public oversight would have to be ensured, which might prove difficult in an international context outside the CDM. Double membership in public and private schemes by one emitter could also cause severe problems of double counting.¹⁸⁴

The situation is different for the other direction of trading. As private trading schemes are likely to be seller's markets, participants in them will have little incentive to adopt rules on the recognition of 'public units'. If they choose to do so, they will be free to determine based on which environmental standards they accept units. It would rather be the public scheme opposing the sale of 'public units' into a private scheme, especially if the public scheme is located in a jurisdiction that has an Annex-B reduction commitment. Two cases have to be distinguished here:

1. If the geographical coverage of the private scheme is the same or smaller as the one of the public scheme, such a transfer does not change the aggregate emissions in the jurisdiction of the public scheme and will thus not be seen as problematic.

2. If the private scheme extends beyond the borders of the jurisdiction of the 'public scheme', there will be more concerns, as trading units into the private scheme implies the cancellation of AAUs in the national inventory of the public scheme jurisdiction in order to maintain an environmentally sound accounting. In the case of the Chicago Climate Exchange, the membership can be from the United States, Canada and Mexico, thus three

¹⁸³ Haites & Mullins, *supra* note 90, p. 52.

¹⁸⁴ Haites & Mullins, *supra* note 90, p. 79.

countries that have a different status with respect to the Kyoto Protocol.¹⁸⁵ So far, there seems to have been only one transaction in which allowances from a public scheme, the EU ETS, were sold into the Chicago Climate Exchange.¹⁸⁶

Convincing examples of private cap-and-trade schemes apart from the Chicago Climate Exchange are missing so far. Furthermore the problems outlined above would, particularly from the start of the first Kyoto commitment period on, likely lead to a high administrative burden in linking and increase transaction cost, so that linking between public and private schemes currently does not seem like an advisable step.

9. At what point of time is linking feasible?

Another important dimension determining the prospects of linking emissions trading schemes is temporal. Albeit the strong criticism and partly diminishing support of the Kyoto Protocol, the timelines it sets are important for linking.

Before 2008, there are no formal reduction commitments of countries in the Kyoto Protocol. Kyoto units are only going to be issued at the beginning of the first commitment period in 2008,¹⁸⁷ with the exception of CERs, which have already been available since 2005.¹⁸⁸ So the use of Kyoto units in linked systems is limited before 2008. The fact that no underlying country commitments exist for that period would make linking of very different systems easier, although it would involve considerable extra

¹⁸⁵ See online under <<http://www.chicagoclimatex.com/info/membershipCategories.html>>; before the Kyoto Commitment period, trading would theoretically be easier, as mutual unit recognition could take place by treating other scheme's units as offset units, see Haites & Mullins, *supra* note 90, at p. 80, who at the same time foresee the high cost of such an approach; such trading would as well be irrelevant for the national emissions inventory with respect to Kyoto and therefore not very attractive to Kyoto Parties.

¹⁸⁶ This was a transaction by a Baxter Healthcare Corporation facility in Ireland to Baxter North America, EU allowances were cancelled and a corresponding amount of CCX allowances issued. A cancellation of AAUs by Ireland was not required, as the transaction took place before the Kyoto commitment period, see press release by the CCX of May 4, 2006, online:

<<http://www.ghgprotocol.org/DocRoot/sA8d8PHg3bcUOqFFYFDO/ghg-protocol-revised.pdf>>.

¹⁸⁷ Before 2008, there will be no AAUs and RMUs in existence, consequently no ERUs can be generated by conversion from these unit types; the EU ETS does consequently allow the use of ERUs only from 2008 on, EC Directive 2003/87, *supra* note 17, Art. 11a.1,2; the solution of making JI available from the beginning of the scheme on had been favored earlier, see European Climate Change Program Working Group on JI/CDM, "Conclusions" (15 November 2002), online:

<http://europa.eu.int/comm/environment/climat/jicdm/jicdm_final_conclusions.pdf>.

¹⁸⁸ IETA, press release "Historic First Steps Towards Ensuring a Viable Global GHG Market" (21 October 2005), Online: IETA <<http://www.ieta.org/ieta/www/pages/getfile.php?docID=1200>>; Lefevere, *supra* note 303, at p. 522.

work on the mutual recognition of traded units¹⁸⁹ and likely make it more difficult to foresee the environmental consequences of linking. Linking as a process of international coordination also takes considerable time, so that the conclusion of linking efforts before 2008 is rather unlikely if they have not been already initiated to date.¹⁹⁰ The de facto use of the CDM in the EU ETS seems to have been very limited so far.¹⁹¹

Linking will be very feasible for the first Kyoto commitment period (2008-2012), which is the scenario mainly examined in this paper. The Annex-B club can greatly facilitate linking by creating domestic currency with a Kyoto unit ‘backside’, i.e. units that are available for domestic as well as for international compliance.¹⁹²

For the period after 2012, it is unclear so far, what is going to be the successor of the Kyoto Protocol’s first commitment period. The first scenario is that the international community will largely hold on to the Kyoto architecture and decide on one or more future commitment periods with new (more or less stringent) targets. A second scenario is that the Kyoto architecture is given up without being replaced by any significant new approach, or that the Protocol formally continues to be in force but more major emitters decide to opt out of it. The only global instrument addressing climate change would then be the UNFCCC. The situations with respect to linking would then correspond to the pre-2008-2012, respectively pre-2008 periods. The international community could, third, also choose a more inclusive approach to emissions regulation and trading¹⁹³ which would make obsolete most questions of linking as they are discussed here.

10. What legal form should linking take?

With respect to public schemes, I will in the following attempt to outline which legal instruments of international and domestic law could be used to achieve the linking of two or more schemes.

¹⁸⁹ Blyth & Bosi, *supra* note 225, at p. 21-22.

¹⁹⁰ The only exceptions are the linking efforts of the EU with Norway and other European states, see *supra* p. 1.

¹⁹¹ Carbonpositive, CER Market Report, “CER prices follow EU market down” (12 October 2006), Online: carbonpositive <<http://www.carbonpositive.net/viewarticle.aspx?articleID=137>>.

¹⁹² See *supra* p. 51.

¹⁹³ Compare Lutz Wicke, *Beyond Kyoto - A New Global Climate Certificate System* (Heidelberg: Springer 2005).

a) Multilateral Agreement

A multilateral agreement defining standards for the mutual recognition of credits between different trading systems is one option that could be considered. Such an agreement would initially have to cover a number of participants and be open for further participants to sign on. It would consequently avoid the delays of various bilateral negotiations for agreements and frictions between the terms of those agreements.

However, the environmental stringency of the standards would be an extremely crucial point here. It is likely, that some kind of compromise between environmental performance and economic/administrative efficiency would arise from the negotiations of a multilateral agreement. This might cause some participants to seek escape clauses towards more stringent or less stringent standards, an effect that might compromise the liquidity and efficiency gains from a multilateral approach. Price differentials would most likely arise.¹⁹⁴

The Kyoto framework already constitutes a multilateral approach setting a standard framework for JI/CDM credits. It does, however, precisely reflect the concerns of differing standards named above, with some systems (e.g. the EU ETS) not accepting all credits as “common currency”.¹⁹⁵ At least we can state that the Kyoto Protocol and the Marrakesh Accords provide a general framework and the widest international consensus available today. Should a multilateral linking agreement be negotiated among the Annex-B membership to the Protocol, they could serve as a general frame of reference. The limited membership of the Annex B, and thus of countries with caps leads us to another difficult point in terms of obtaining a multilateral agreement. Already, 23 of the 38 countries with targets are part of the EU ETS, some others are likely to follow.¹⁹⁶ With the EU ETS having emerged as the major emissions market of the world at least for the time being, linking efforts will most probably be centered around the EU ETS,¹⁹⁷ which would negotiate bilateral agreements with other schemes. A multilateral agreement may

¹⁹⁴ This can happen also in the case of bilateral linking. The change in demand resulting from different standards of allowance/credit acceptance should, due to higher overall market liquidity, be smaller than in the case of only two systems being linked.

¹⁹⁵ EC Directive 2003/87, *supra* note 17, Art. 11a.3.

¹⁹⁶ It has further to be kept in mind that two major emitters of these 38, the US and Australia are not participating in the Kyoto process at the moment, which increases the relative ‘weight’ of the EU.

¹⁹⁷ Compare Blyth & Bosi, *supra* note 225, who take this as the general starting point to their paper.

be negotiated as part of the post-2012 Kyoto talks, but as the outcome of these is still unknown, any reasoning on this would be speculative at this point.

b) Bilateral approach

Ultimately, a bilateral approach with the EU at its center seems more likely at present. The advantage of a bilateral approach lies in the possibility for parties to include individual terms with respect to environmental performance in the agreement.

If one country links with more than one other country, similar concerns as in the case of multilateral agreement can arise, if the standards adopted in the two linking agreements differ substantially. The exchange between the two formally not linked schemes becomes possible via the third scheme they both have established a link with. The third scheme could here serve as a platform for the intermediary-based “conversion” of units that would not be allowed into one of the schemes into ‘acceptable’ currency. Consequently, the scheme with the most stringent standards on units would economically benefit from the lower compliance cost in the overall market due to the higher supply of credits. At the same time, the environmental performance of the overall scheme would drop below what was deemed desirable by the country with the most stringent standards.¹⁹⁸ Such an outcome would be avoided if the ‘central country’ was the country with the most stringent standards, but other risks of linking for environmental performance would persist.¹⁹⁹ As stated before, for sub-domestic schemes, the federal regulator could conclude a ‘framework agreement’ that allows the regulator of the sub-domestic scheme to establish the details of linking itself.²⁰⁰

c) Informal/unilateral linking

Furthermore, there is the possibility of informal or unilateral linking between schemes, i.e. linking occurring in the absence of an international agreement. How could this work? As we have seen in the example of RGGI, a scheme could issue units against the proof that units have been cancelled in another scheme, taking into account that a

¹⁹⁸ Compare Haites & Mullins, *supra* note 90, at p. 63.

¹⁹⁹ Then, however, a price differential between the prices of different unit types would arise, as we have previously seen in the case of purely bilateral linking, *supra* p. 51, this could lead to selling of commonly accepted units out of the less stringent scheme and their replacement with units that only satisfy the rules of the less stringent scheme.

²⁰⁰ See *supra*, p. 32.

certain amount of carbon emissions will not be permitted in this scheme any more. This can work to a certain degree, depending on the nature of credits. If these are purely private rights and their cancellation can be achieved by the private party holding the unit alone, then no major obstacles seem to exist here. All schemes examined allow for the cancellation of units by private parties.²⁰¹

Unfortunately, the situation is complicated by the existence of the Kyoto Protocol units backing up the domestic credits in Kyoto Parties' schemes. The cancellation of these is possible,²⁰² but only by the country holding them. A private party cancelling a domestic allowance would consequently have to obtain the cancellation of a Kyoto unit by its home jurisdiction in order to ensure that fewer emissions are allowed to occur there and make such a transaction environmentally sound.²⁰³ This means that the regulator of the 'formally unlinked' Kyoto scheme would have to be involved in the process. The willingness of this regulator to allow for the exportation of credits into another scheme will depend on the general scarcity of credits in its own scheme as well as on the situation with respect to the domestic Kyoto target. Imports, on the other hand, would not be feasible, albeit possible.²⁰⁴ Therefore the efficiency benefits of a linked market would be limited. Transaction costs would be rather high in this approach.

Assuming that both schemes would be ready to allow for this 'unilateral import procedure', they could also proceed to an agreement based on mutual recognition of units, unless there are other obstacles to linking. Unilateral import of units is most likely to be used by domestic schemes not covered by the Kyoto Protocol and by sub-domestic schemes like RGGI which have no access to the instrument of an international agreement.

d) Linking via private intermediaries?

Before the methodologies and procedures of the Kyoto Protocol were further refined by the Marrakesh Accords, there was the idea of a privately managed 'carbon repository' that would hold, convert and exchange unit from different domestic emissions trading

²⁰¹ See in particular EC Directive 2003/87, *supra* note 17, Art 12.4; RGGI Model Rule, *supra* note 160, XX-10.2(ac) indicates, that retirement can also be initiated by the emitter.

²⁰² UNFCCC COP Decision 19/CP.7, Annex para. 12.

²⁰³ When domestic and international units are inseparably linked (as in the EU ETS) this problem does not arise.

²⁰⁴ See *supra* p.31.

schemes.²⁰⁵ Such a private repository would, however, have lacked the ability to convert units by itself, even if had held substantial amounts of units from different schemes for trading purposes. It would not have been capable of allowing installations from scheme A to buy units from scheme B that were suitable for compliance purposes in scheme A, as this would have depended on the recognition by the regulator of scheme A. The concept included the creation of a ‘common currency’ by the repository that would have been recognized by different schemes.²⁰⁶ However, it would have been difficult and potentially costly to create the relationship between this currency and the transfers of AAUs relevant in the Kyoto context.

11. Excuse: WTO law and linked emissions trading schemes – a source of conflict?

The WTO/GATT agreements and the UNFCCC/Kyoto Protocol do not explicitly refer to each other. As the WTO has a very wide membership in large parts overlapping with the UNFCCC/Kyoto parties, the question of potential conflicts has arisen.²⁰⁷ Here the question of the relevance of the WTO trade disciplines for domestic emissions trading schemes deserves attention. These might force countries to accept foreign emissions reduction units into their domestic emissions trading scheme as a result of the Most favored nation clause (Art I GATT 1994), the national treatment clause (Art. III GATT 1994) and the prohibition of quantitative restrictions on imports (Art XI and XIII GATT 1994) or of the equivalent provisions of the GATS. There is no WTO panel ruling on this kind of ‘forced linking’ to date.²⁰⁸ The following discussion therefore has to depend on the hypothesis that emissions units are going to be qualified as either ‘goods’ or ‘services’ falling into the scope of the WTO agreements.²⁰⁹ Should there be no such

²⁰⁵ Haites & Mullins, *supra* note 90, at p.76, 80, the concept was developed by the Emissions Market Development Group, an initiative of Arthur Andersen, Credit Lyonnais, Natsource and Swiss Re; the idea has apparently has been given up by the companies that initiated it

²⁰⁶ *Ibid.*

²⁰⁷ Sikina Jinnah, “Emissions trading under the Kyoto Protocol: NAFTA and WTO concerns”, 15 *Geo. Int’l Evtl. L. Rev.* 709 [Jinnah]

²⁰⁸ And no request for consultations has been filed so far.

²⁰⁹ There have been negotiations on the liberalization of trade in ‘environmental goods’ during the Doha Round, but these did not refer to emission rights, see generally Ronald Steenblik, “Liberalising Trade in “Environmental Goods”: Some Practical Considerations”, (2005) OECD Trade and Environment Working Paper No. 2005-05, online: <<http://www.oecd.org/dataoecd/25/8/35978987.pdf>>.

qualification, the WTO agreements would be irrelevant for domestic emissions trading schemes.²¹⁰

Two different situations have to be distinguished here.²¹¹ First, if units created by the Kyoto Protocol are transferred between Protocol parties, no trade in the sense of the WTO agreements is involved, as no market is created but rather commitments under international law are reallocated between states.²¹² The focus here shall rather be on the second situation, the market for emissions rights in which private legal entities participate. Here one could argue that the exclusion of emissions units/credits issued by a non-Kyoto Party would constitute a violation of the above-mentioned trade disciplines. This would presuppose that these units were deemed to be ‘like products’ in relation to the respective domestic units.²¹³ The concern of a domestic regulator banning units from its trading scheme would likely be to keep them ineligible for compliance purposes in its own scheme. *Jinnah* employs the test developed in the *Asbestos* ruling of the Appellate Body²¹⁴ to argue that credits originating from a foreign party would likely not be regarded as ‘like products’ by the WTO. In particular, she argues that the possible end-uses (compliance) of the units are different. Saying this, she does not take into account that the differing eligibility for domestic compliance is not a consequence of the properties of the product in itself, but in fact a result of the regulatory measure in

²¹⁰ Werksman, Jacob, “Greenhouse Gas emissions trading and the WTO”, (1999) RECIEL 8(3), 251 [Werksman] p. 252, see also *ibid.* p. 256 where he makes an analogy to currency having value as legal tender in only one specific jurisdiction; Jinnah, *supra* note 207, p. 749; see generally Matthieu Wemaere and Charlotte Streck, “Legal Ownership and Nature of Kyoto Units and EU allowances” in: Freestone & Streck, *supra* note 5, p. 35 [Wemaere & Streck] at p. 46, who argue that emissions units do not qualify as ‘products’ in the sense of the GATT due to their lack of materiality and do not qualify as ‘services’ as defined in the GATS due to their absence in the WTO Services Sectoral Classification List (online: EU <http://trade-info.cec.eu.int/doclib/docs/2003/november/tradoc_114182.pdf>) and the UN Provisional Central Product Classification system (online: UN <<http://unstats.un.org/unsd/cr/family2.asp?Cl-9>>); Under the Montreal Protocol Trading system, there was no classification of production quotas as ‘products’ or ‘services’, compare also Werksman, *supra* note 210, at p. 256.

²¹¹ See generally Werksman, *supra* note 210, at p. 251.

²¹² *Ibid.*, at p. 253; Wemaere & Streck, *supra* note 210, at p. 46; Jinnah, *supra* note 207, p. 749, seems to take a different view on the issue, as she uses governments as one example of a ‘customer’ of US-generated emission reduction units.

²¹³ See generally Wemaere & Streck, *supra* note 210, at p.18.

²¹⁴ The criteria of the Appellate Body are: (1) physical properties of the products, (2) the end uses of the product; (3) consumer’s tastes and habits; (4) tariff classification; and (5) the risk associated with the product, *European Communities - Measures Affecting Asbestos and Asbestos-Containing Products (Complaint by Canada)* (2001), WTO Doc. WT/DS135/AB/R at para. 101 (Appellate Body Report), online: WTO <<http://docsonline.wto.org/DDFDocuments/t/WT/DS/135ABR.doc>>.

question.²¹⁵ Thus, the Asbestos ruling may constitute a poor starting point for the analysis of the likeness of products. But another point of the Appellate Body's reasoning may be decisive and fruitful here: the first prong of analysis proposed by the AB is to look at the physical properties of the product. Even though emissions units do not have any physical properties in the narrow sense of the term, the action they represent, i.e. an emissions reduction can be subject to some comparison of 'physical likeness'. So as long as an importer can make a case for his units representing real emissions reductions generated according to standards corresponding to those in the target market, there may be the possibility of a WTO dispute arising. As long as the WTO rulings would emphasize the paramount importance of environmental equivalence, the necessity to open up an emissions trading scheme to other countries' credits does not create any environmental concerns. If, however, the country banning certain imported credits from its scheme is a party to the Kyoto Protocol, whereas the importer is not, the scope of the problem widens. The concern of the domestic regulator now is not only environmental performance, but also Kyoto compliance. As transfers of units from a non-Kyoto scheme are not backed up by AAUs²¹⁶, they endanger Kyoto compliance prospects of the Kyoto party, which would have to allow increased emissions to its domestic emitters, but receives no internationally relevant entitlement to increase domestic aggregate emissions. In this case, the ban or prohibition of use for compliance regarding foreign not-Kyoto-backed units may have to be justified under the exception of Article XX (b) or (g) GATT or Art. XIV GATS.²¹⁷ Given that the appellate Body recently has taken more generous approach towards unilateral trade measures,²¹⁸ such an exception would likely be granted, especially as the measure's rationale is based on the requirements of a multilateral environmental agreement.²¹⁹

²¹⁵ Or, if we assume that the measure in question is an 'importation ban', not allowing foreign credits to be used towards compliance, this results in a treatment different from the treatment granted to domestic (and potentially other imported) units. As units are inherently defined by law and not by physical properties

²¹⁶ As non- Annex-B parties and non-ratifiers do not have an Assigned Amount under the Protocol.

²¹⁷ Jinnah, *supra* note 207, p. 734.

²¹⁸ *United States – Import prohibition of certain Shrimp and Shrimp products (complaint by, India, Malaysia, Pakistan and Thailand)* (1998), WTO Doc. WT/DS58/AB/R at para 38 (Appellate Body Report), online: WTO <http://www.wto.org/english/tratop_e/dispu_e/58abr.pdf>, [hereinafter Shrimp/Turtle AB].

²¹⁹ See generally Shrimp/Turtle AB, *supra* note 218, at paras. 122 and 130.

The treatment of intermediaries in the emissions market, such as brokers and financial institutions is a different issue. The services and derivatives they offer would clearly fall under the scope of the GATS.²²⁰ Everything said so far has been dealing with the relevance of the WTO rules for international trade in emissions units, not for the underlying markets in goods and services. Emissions trading schemes can be in conflict with WTO rules, if they subsidize certain domestic emitters due to their process and production methods²²¹ or restrict the importation of fuel and energy products.²²² A full treatment of these effects is outside the scope of this paper. In addition, these effects arise in complete independence of the linking of emissions trading schemes and establishing linkages will rather mitigate than worsen them.²²³

II. Part II: Scheme coverage and unit definition and recognition

1. Scheme coverage

The emissions included in a scheme are determined by four major regulatory choices. First, the geographical coverage has to be determined. Second, it is necessary to determine the Greenhouse Gases included in the scheme. CO₂ is by far the most important GHG, but other gases equally have a high global warming potential, even if they are emitted in lower absolute quantities.²²⁴ Emissions of other greenhouse-effect relevant gases are in many cases harder to measure than, although reductions may be achievable at lower cost.²²⁵ Mutually accepted, transparent methodologies²²⁶ and conversion factors between gases will be a prerequisite for successfully linking schemes with different coverage in gases. Economic advantages in the form of more and cheaper

²²⁰ Jinnah, *supra* note 207, p. 743; Wemaere & Streck, *supra* note 210, p. 47.

²²¹ Werksman, *supra* note 210, at p. 259.

²²² Werksman, *supra* note 210, at p. 258, cites the example of an upstream emissions trading scheme here that would effectively limit the total amount of fuel that can be in the domestic market and as a consequence, imported, the Article affected here would be Article XI GATT (1994).

²²³ Compare *supra* p. 12.

²²⁴ See IPCC TAR, *supra* note 33, at p. 47 for the levels of methane in the atmosphere as opposed to CO₂; Victor, *supra* note 68, at p. 58.

²²⁵ William Blyth and Martina Bosi, "Linking Non-EU Domestic Emissions Trading Schemes with the EU emissions trading scheme" (2004) OECD/IEA Document, online: OECD <<http://www.oecd.org/dataoecd/38/7/32181382.pdf>>, [Blyth & Bosi] p.16; Victor, *supra* note 68, at p.59.

²²⁶ *Ibid.*, p.16.

abatement options will tend to arise for emitters in schemes with wider coverage and consequently also in a system of linked schemes.²²⁷

Third, the included emitters must be chosen, which can happen either based on sectors or minimum emission threshold basis or a combination thereof. A regulator can choose to establish emissions trading with obligations for emissions monitored at their sources (downstream approach) or based on the GHG content of the fuels produced in and imported to a country (upstream approach). The former approach would typically cover mainly large emitters, as their emissions can be monitored with limited administrative effort, whereas the latter approach would cover almost all fuels burned and consequently nearly all fuel-based emissions of an economy, even if the trading sector was restricted to fuel and resource providers.²²⁸ Both approaches can be combined.²²⁹ Linking upstream and downstream approaches may lead to double counting of emissions reductions if there are no proper emissions accounting rules governing the exportation of fuels and energy products.²³⁰ The introduction (by importation or production) of less-emitting fuels into an upstream scheme should, for example, lead to reductions claimed by the company in that scheme only, if the fuel was also consumed domestically. If the consumption, as opposed to this, took place in a linked downstream scheme, the reduction should only accrue to the consuming emitter in the downstream scheme. Furthermore, there can be provisions allowing entities to opt into or out of a scheme (opt-in and opt-out provisions)

What do these regulatory choices concerning sectoral coverage imply for linking? Differences in sectoral coverage should not pose a major impediment to linking, as the absence or leniency of targets for certain sectors would occur also in the absence of linking.²³¹ It would even be possible to link the very different approaches of upstream and downstream schemes, as long as consistent methodologies are in place and double counting is avoided.²³² The number of installations covered by a scheme mainly determines its economic efficiency. But sectoral coverage also has implications for

²²⁷ Blyth & Bosi, *supra* note 225, p.16; Haites & Mullins, *supra* note 90, at p. 39.

²²⁸ Wicke *Beyond Kyoto*, *supra* note 73, at XXI.

²²⁹ Haites & Mullins, *supra* note 90, p.38.

²³⁰ Bygrave & Bosi, *supra* note 372, at p. 17.

²³¹ Blyth & Bosi, *supra* note 225, p. 17.

²³² *Ibid.* p.17.

environmental performance, once the question arises, whether the original set of emitters included in the scheme can be modified. If participation is entirely voluntary for entities, there will typically be a lack of incentives to participate. Public relations and relations with government agencies are conceivable incentives to participate in such a scheme, as well as the expectation to generate a large amount of surplus credits.²³³ In sectors characterized by a high degree of competitiveness, free-riding on other's efforts may become a rather attractive option.²³⁴ Consequently emissions leakage is very probable in such schemes, as not even all comparable installations of one particular sector will be covered by the scheme.²³⁵ As participation in a voluntary scheme is mainly attractive for entities for the sake of surplus credits, in a situation where one of two linked schemes is voluntary there will likely be a net supply of credits flowing into the mandatory scheme, lowering its environmental performance.²³⁶ Linking between voluntary and mandatory schemes seems very problematic for this reason.

Opt-In provisions in a scheme may affect the environmental performance of a scheme and lower the overall price of allowances. If two schemes were linked, the overall price of allowances will also fall. This problem is very similar to the question of allocation to subsequent entrants.²³⁷ If, in one system, allowances are allocated generously to installations opting in, the environmental performance of the linked schemes may suffer. Opt-out provisions for installations will tend to diminish the liquidity of the trading market and the efficiency of the scheme. If the NTS is subject to more lax reduction requirements, the environmental performance will inevitably suffer as well. The effect on a linked emissions trading market will strongly depend on how restrictive the respective provisions are.

Fourth and final, the regulator can choose to limit emissions accounted for at an installation to the emissions occurring directly there (direct emissions) or can alternatively choose to include also emissions based on the generation of the electricity

²³³, see Haites & Mullins, *supra* note 90, at p. 40; this may be different, if the NTS is subject to very strict reduction requirements. This might lead to a de-facto mandatory trading scheme.

²³⁴ *Supra*, p.13.

²³⁵ Haites & Mullins, *supra* note 90, at p. 40.

²³⁶ *Ibid.*

²³⁷ Blyth & Bosi, *supra* note 225, p.18,25.

consumed there (indirect emissions).²³⁸ Double counting can be a major issue when linking a direct and an indirect scheme.²³⁹

a) Kyoto Protocol

The Kyoto Protocol starts from the notion of ‘carbon dioxide equivalent emissions’ and includes six gases that are regarded as such emissions in its Annex A.²⁴⁰ Emissions of different gases are freely ‘convertible’ following the ratios given by the IPCC in its third assessment report.²⁴¹ As an international agreement, the Protocol does not refer to individual installations, but to countries ‘aggregate anthropogenic emissions’,²⁴² and requires them to establish a national inventory of such emissions.²⁴³ The detailed methodologies for the establishment of such inventories were agreed upon by the conference of the parties.²⁴⁴ Therefore a sector- or emission threshold does not exist, as practically all domestic emissions of the relevant gases are covered, which does not exclude that some inaccuracies and uncertainties remain.

b) EU ETS

The EU ETS currently is a purely CO₂-based scheme that is restricted to certain ‘categories of activities’ i.e. sectors,²⁴⁵ although it could potentially cover more gases and

²³⁸ *Ibid*, p. 17.

²³⁹ Linking a scheme that accounts only for direct on-site-emissions to one that also includes the emissions from the generation of the electricity consumed is equally a question of proper accounting standards. If the direct scheme exports electricity, it has to be accounted for as carbon-free in the indirect scheme, as its carbon content is already taken into account during generation. Trade in energy in the other direction potentially would not be accounted for its carbon content at all. Possible solutions involve assigning the emissions to the exporting entity or to require the importer to be liable for the emissions generated for the electricity generation in one of the schemes. Gateways in this linking scenario have to take into account the distortions energy exports cause with respect to emissions actually occurring in the two schemes. Addressing those distortions becomes more pressing if the scale of energy exportation is big and one or both jurisdictions are bound by the Kyoto Protocol, *See Ibid*, p. 17.

²⁴⁰ Art. 3.1 Kyoto Protocol, Annex A Kyoto Protocol, the included gases are carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons (HFCs), Perfluoromethane. These gases are assigned global warming potentials with respect to carbon dioxide as a ‘baseline-gas’ and with a time horizon of 100 years. This methodology is based on the Second Assessment Report of the IPCC from 1995.

²⁴¹ Kyoto Protocol, Art. 5.3.

²⁴² Kyoto Protocol, Art. 3.1.

²⁴³ Kyoto Protocol, Art 5.1.

²⁴⁴ Kyoto Protocol MOP Decisions 13/CMP.1 and 15/CMP.1.

²⁴⁵ See Annex I to EC Directive 2003/87, see *supra* note 17: the EU ETS covers in the energy sector: combustion installations with a rated thermal input exceeding 20 MW, mineral Oil refineries, coke ovens; the production and processing of ferrous metals; cement production above a certain threshold, glass manufacture, ceramic manufacture; as well as pulp and paper production.

sectors.²⁴⁶ Discussions on an expansion of the scheme are currently under way.²⁴⁷ There is an option for member states to unilaterally include further gases and activities into the trading scheme.²⁴⁸ There is no explicit definition of the global warming potential of other gases in relation to CO₂ in the directive, but the definition of ‘tonne of carbon dioxide equivalent’,²⁴⁹ and the recitals of the directive²⁵⁰ strongly suggest, that the relative potentials of the gases are intended to be determined following future COP and COP/MOP decisions. As far as the use of international project-based credits is allowed, projects may also be based on the reduction or avoidance of emissions of other Kyoto gases than CO₂.²⁵¹ The directive also includes opt-out provisions for the first trading period (2005-2007), on the condition that equivalent reductions, monitoring, reporting and verification as well as penalties are enforced by the respective member state.²⁵² Member states can also opt in certain installations and other gases on approval by the EC Commission.²⁵³

c) RGGI

The RGGI scheme applies to direct emissions from electricity generators of 25MWe and more nameplate capacity.²⁵⁴ RGGI is currently limited to trading in CO₂ allowances,²⁵⁵ but the proposed offset system includes projects that relate to other gases, in particular methane and sulfur hexafluoride.²⁵⁶ For the purposes of converting

²⁴⁶ *Ibid*, Annex II of the Directive covers all Kyoto gases.

²⁴⁷ A comprehensive overview of expansion options for the EU ETS and their feasibility is provided by: LIFE Emissions Trading Scheme, “LETS Update: Scoping Phase Report” (2006) online: Ends Europe Daily <<http://www.endseuropedaily.com/docs/60509b.pdf>>.

²⁴⁸ EC Directive 2003/87, see *supra* note 17, Art. 24: an approval of the EC Commission is required.

²⁴⁹ *Ibid*, Art. 3, it explicitly refers to the term ‘global –warming potential’ which is the term used in the respective Annex to the Kyoto Protocol and by the IPCC in its Assessment Reports.

²⁵⁰ *Ibid*, Recital 22.

²⁵¹ This is not explicitly mentioned anywhere in the Directive, but follows from the general inclusion of CERs and ERUs into the scheme, see EC Directive 2003/87, see *supra* note 17, Art. 11a.

²⁵² The European Commission decides on the opt-out following application by a particular member state, EC Directive 2003/87, *supra* note 17, Art. 27.

²⁵³ *Ibid*, Art. 24.

²⁵⁴ RGGI Model Rule, *supra* note 160, XX-1.4 (a), certain apply exceptions for generator that output less than 10 percent of their generation into the electrical grid for legal reasons, see *ibid*. (b).

²⁵⁵ RGGI Model Rule, *supra* note 160, XX-1.2 (j), definition of ‘CO₂ allowance’.

²⁵⁶ The eligible offset project types currently are: (i) landfill methane capture and destruction, (ii) reduction in emissions of sulfur hexafluoride (SF₆), (iii) sequestration of carbon due to afforestation, (iv) reduction or avoidance of CO₂ emissions from natural gas, oil, or propane end-use combustion due to end-use energy efficiency, and (v) avoided methane emissions from agricultural manure operations, see RGGI Model Rule, *supra* note 160, XX-10.3 (a)(1).

reductions in other gases into CO2 equivalents, the Model Rule explicitly refers to the global warming potential values used by the IPCC in its Third Assessment report.²⁵⁷ There are no opt-in or opt-out rules.

d) Canadian Large Final Emitter system

The Canadian Large Final emitter system was intended to operate based on CO2-equivalents and to cover seven Greenhouse gases in total, adding perfluoroethane to the gases mentioned in the Kyoto Protocol.²⁵⁸ The global warming potential of these gases is determined in relation to CO2, and in accordance with the Kyoto assumptions.²⁵⁹

The covered installations were defined by two criteria in the Climate Change Plan, according to which a large final emitter is an installation with: (a) annual average emissions of 8 kt carbon dioxide equivalent (CO2e) per establishment or more; and (b) annual average emissions of 20 kg CO2e per \$1000 gross production or more,²⁶⁰ indicating that the Canadian scheme is a direct scheme. A Notice of Intent to regulate which was published later, however, left the threshold issue open again. So it is unclear, which installations would have been included in the Canadian scheme, and which provisions on opt-in and opt-out rules would have been chosen.²⁶¹

e) Other examples

The **Norwegian** scheme is a nationwide CO2 trading system for direct emitters from certain sectors of the economy.²⁶² The participation of emitters will be determined due to thresholds.²⁶³ The **Chicago Climate Exchange** covers direct emissions of all six Kyoto Gases, using the IPCC Global Warming Potential to express them in CO2 equivalents.²⁶⁴

²⁵⁷ RGGI Model Rule, *supra* note 160, XX-1.2 (al).

²⁵⁸ Interpretation part in Instructions Cross-cutting provisions, *supra* note 146; see also *ibid*, schedule 1.

²⁵⁹ *Ibid*, schedule 1.

²⁶⁰ See Environment Canada website, online: <<http://www.ec.gc.ca/lfe-gef/home-lfe.htm>>.

²⁶¹ Canada, Notice of intent, see *supra* note 147, para. 2.6.

²⁶² The act covers CO2 emissions origination from energy production, refining of mineral oil, coke production, production and processing of iron and steel, including roasting and sintering of iron ore, production of cement, lime, glass, glass fibre and ceramic products. The Act does explicitly not apply to emissions from the combustion of biomass, the combustion of hazardous or municipal waste and emissions liable to CO2 tax under the terms of the Storting's annual decision, see Greenhouse Gas Emissions Trading Act, *supra* note 152, at para. 3.

²⁶³ *Ibid*.

²⁶⁴ See online: Chicago Climate Exchange <<http://www.chicagoclimatex.com/about/program.html>>.

Geographically, the membership can be from Canada, Mexico and the United States.²⁶⁵ Membership is entirely voluntary. There is a minimum total emissions threshold for being eligible as a member.²⁶⁶ Currently, 39 entities have taken on reduction obligations.²⁶⁷ The NSW GGAC covers electricity retailers, electricity generation and certain large consumers of electricity on a mandatory basis. Other large consumers of electricity can join on a voluntary basis.²⁶⁸ The scheme consequently is an indirect or demand-side approach. The scheme covers CO₂, NO_x, perfluorocarbons and potentially further gases.²⁶⁹

f) Findings

Most of the examined schemes concentrate on direct downstream emitters of CO₂ as the major Greenhouse Gas. Abatement of other GHGs is an option that finds far more use in offset projects and, in particular, the Clean Development Mechanism.²⁷⁰ Most schemes are mandatory and there is not much use made of opt-in or opt-out rules. Overall, the different coverage of the examined public schemes with respect to gases and installation should be no major problem for linking.

A fundamental flaw of private systems lies in the fact that no entity is obliged to participate in them in the first place. If targets are ambitious, the incentives to participate in a private system are low. Participation in private systems involving reduction commitments will likely only be chosen by companies which can easily fulfill their reduction obligations and will be able to have surplus allowances they hope to sell. Private schemes will thus likely result in seller's markets. Linking into public capped schemes could lead to an inflation in the credit volume and thus lower the environmental performance of the linked scheme.

²⁶⁵ *Ibid.*

²⁶⁶ Haites & Mullins, *supra* note 90, at p. 34.

²⁶⁷ As of October 1st, 2006, see online: <<http://www.chicagoclimatex.com/>>.

²⁶⁸ New South Wales, Introduction to the Greenhouse Gas Abatement Scheme (GGAS) (March 2006), online: <<http://www.greenhousegas.nsw.gov.au/documents/syn91.asp>>.

²⁶⁹ *Electricity Supply Amendment (Greenhouse Gas Emission Reduction) Act 2002* (N.S.W.), definition of 'greenhouse gas', online: <[http://www.legislation.nsw.gov.au/sessionalview/sessional/TITLE/Electricity%20Supply%20Amendment%20\(Greenhouse%20Gas%20Emission%20Reduction\)%20Act%202002%20No%20122.pdf](http://www.legislation.nsw.gov.au/sessionalview/sessional/TITLE/Electricity%20Supply%20Amendment%20(Greenhouse%20Gas%20Emission%20Reduction)%20Act%202002%20No%20122.pdf)> [Electricity Supply Amendment Act 2002].

²⁷⁰ Projects relating to the destruction of HFC₂₃ and N₂O are expected to deliver more than 40 percent of the annual credits, see Jane Ellis and Katia Karousakis, "The Developing CDM Market: May 2006 update" (Paris: OECD/IEA, 2006), online: OECD <<http://www.oecd.org/dataoecd/33/30/36835979.pdf>>, at p.5.

2. Definition and recognition of tradable units

Once the sectoral coverage of a scheme is has been determined, there is the task of defining units available for compliance. If linking to another scheme is desired, it also has to be decided which units from another scheme shall be accepted as suitable for compliance. There are different ways of generating units: In a *cap-and-trade* system, absolute emissions caps are assigned to installations which receive the equivalent of these caps in emission allowances. In a *baseline-and-credit* system the entities get a set baseline of emissions which they are not to exceed. Emissions credits are only generated in such a system when an entity manages to keep its emissions below the baseline. Further, units available for compliance and trading can be generated by reduction projects inside the geographical scope of the emissions trading scheme or outside of it. Such units will here be referred to as offset credits.

Credit definition an recognition: Within every emissions trading scheme units can either be defined independently or the regulator can rely on definitions already made in the international context or in other schemes. A combination of both approaches is possible, and as we will see, typical of the schemes examined here. Which external units are recognized within a trading scheme even without linking can be an important prerequisite for linking efforts with respect to different domestic ‘currencies’, because flexible mechanisms are of considerable importance for many schemes. Environmental and economic concerns as well as international or domestic commitments may influence the choice of units recognized in a particular scheme. Restricting the influx of undesired credits into one scheme may, however, prove a useless effort: If schemes are linked, there will always be a price effect in both schemes in the case of linking, depending on the overall supply of allowances, which can go in both directions, depending on whether scarcity or abundance is added into the respective scheme. Generally, allowances prices will tend to converge, meaning go up in one scheme and fall in the other. Where rules on recognition of units differ, price differences between different credit types may be the result in the linked scheme. The units that are suitable for compliance in the more restrictive scheme would likely be more expensive as there would be more potential

demand for them.²⁷¹ An effect of this can be, that the units not suitable for compliance in one scheme concentrate in the other scheme and that ‘approved’ units are traded into the more restrictive scheme.²⁷² A desired environmental benefit from the exclusion of certain credits would likely be diluted in case of linking.

Differences in measurements used to quantify emissions may also occur, but should be easily remediable.²⁷³

Absolute and relative targets: Another choice that deserves consideration, is whether targets in schemes to link are defined in terms of absolute emission limitations/reductions or relative to some other factor like output of products. In order to enable trading between a relative scheme and a scheme with absolute targets, the relative targets have to be converted into absolute reductions at a certain point of time, a process that is usually referred to as ‘true-up’²⁷⁴ and typically would occur after the end of each compliance period. This would likely not damage overall liquidity on the market too much²⁷⁵, but it might lead to pikes in demand from the relative scheme around the end of the respective compliance period²⁷⁶. Trading in future derivatives may mitigate the latter effect²⁷⁷.

Importation vs. conversion A more formal problem is posed by the way credits are imported into another scheme: It can be chosen to either convert units originating from other schemes at entry into the domestic scheme or to import them and guarantee their recognition for compliance purposes. Conversion may make the tracking of units a more problematic issue, especially if units are getting re-exported. It would at least require a more sophisticated technical coordination between registries. If domestic units have a “Kyoto backside”, the international accounting for them would be ensured by the Protocol.

²⁷¹ Blyth & Bosi , *supra* note 225, at p. 20

²⁷² Haites & Mullins, *supra* note 90, at p. 63.

²⁷³ Henrik Hasselknippe, “Systems for carbon trading: an overview”, (2003) Climate Policy 3S2 43, [Hasselknippe] at p. 56.

²⁷⁴ Canada, Notice of Intent, *supra* note 147, at para. 4.1; Haites & Mullins, *supra* note 90, at p. 48; Blyth & Bosi , *supra* note 225, at p. 22.

²⁷⁵ Blyth & Bosi , *supra* note 225, p. 22.

²⁷⁶ *Ibid.*, p.22; at that point the true-up would be required and companies would have to buy emission rights.

²⁷⁷ Blyth & Bosi , *supra* note 225, p.22.

Offset credits: The inclusion of offset credits lowers compliance costs for emitters,²⁷⁸ but brings up three further issues: additionality, double counting and the relationship of offsets to reductions inside a scheme. Additionality has been defined differently in the past. In a narrow understanding it means that credits should not be granted for reduction activities that are mandatory under any regulatory requirement or supported by publicly financed incentives,²⁷⁹ a wider approach excludes also credits from projects that were induced by some financial incentive from outside the respective trading scheme.²⁸⁰ The additionality requirement serves to exclude windfall profits from credit generation. It also ensures that emissions reductions are not excessively transferred into the non-trading sector. Under an economy-wide cap, a lax approach to additionality should not lower the overall level of reductions. It may, however, diminish the contribution of the trading sector to these reductions. In a linking scenario, the same should apply.

The second issue, double counting, has more severe implications for the environmental performance of a scheme or of linked schemes. Double counting occurs when the same reduction is accounted for in more than one emissions reduction program and therefore the environmental value of the credits is cut in half while they are formally still represent ‘full’ reductions. This arise, where reduction credits are awarded, for example, based on a project funded by a country A reducing the emissions of a plant in a country B by cleaner technologies. If country B also awards credits for this a fictive reduction “on the paper” comes into existence that is twice as high as the actual outcome of the project.²⁸¹ Double counting is a problematic issue already in the absence of linking,²⁸² but it may harm the environmental performance of the overall scheme, as it increases the total supply of units without backing them up with corresponding

²⁷⁸ Compare EC, Commission, „Commission Staff Working Paper – Extended Impact Assessment on the Directive of the European Parliament and the Council amending Directive establishing a scheme for greenhouse gas emissions allowance trading within the Community, in respect of the Kyoto Protocol’s project based mechanisms {COM(2003)403 final}“ (Brussels: EC, 23 July 2003) [hereinafter EC Extended Impact Assessment]

Online: http://ec.europa.eu/governance/impact/docs/ia_2003/sec_2003_0785_en.pdf, p.20

²⁷⁹ Environment Canada, “Offset System for Greenhouse Gases - Technical Background Document”, online: <http://www.climatechange.gc.ca/english/publications/offset_gg_tech/2.asp#a5> [Technical Background Document Offsets], para. 42.

²⁸⁰ Driesen, Free Lunch, *supra* note 45, at p. 82.

²⁸¹ Bygrave & Bosi, *supra* note 42, at p. 35.

²⁸² Haites & Mullins, *supra* note 90, at p. 66, where they present the example of the issuance of multiple credits for a single action abating different pollutants.

reductions.²⁸³ Offset projects must therefore be placed outside the boundaries of each emissions trading scheme participating in linking.

Finally, there is a risk of emissions reductions being ‘outsourced’ if offsets are available too abundantly. Internationally, reduction obligations can thereby be transferred to other countries, domestically to the non-trading sector, foregoing reductions in the main emitting sectors of the economy.²⁸⁴ This may lead to problems with respect to wealth distribution and technological change.²⁸⁵

a) Kyoto Protocol

The Kyoto Protocol knows six types of units that are eligible for compliance by its parties: AAUs, ERUs, CERs, tCERs, ICERs and RMUs.²⁸⁶ At the end of each compliance period, Parties are required to hold sufficient units in their national registries to cover the emissions contained in their national inventory. The use of land-use, land-use change and forestry (LULUCF) CERs is limited reforestation and afforestation projects and to one percent of a parties’ yearly Assigned Amount for the first commitment period.²⁸⁷ Parties are further to refrain from the use of credits generated by the use of nuclear facilities.²⁸⁸ There are several references in the Protocol deeming units from the flexible mechanisms to be supplemental to the fulfillment of its obligations.²⁸⁹ This obligation has never been defined in quantitative terms, but later been expressed by a qualitative formula in the Marrakesh Accords.²⁹⁰ Further, The Protocol demands that "a reduction in emissions by

²⁸³ Bygrave & Bosi, *supra* note 42, at p. 35.

²⁸⁴ EC, Commission, „Commission Staff Working Paper – Extended Impact Assessment on the Directive of the European Parliament and the Council amending Directive establishing a scheme for greenhouse gas emissions allowance trading within the Community, in respect of the Kyoto Protocol’s project based mechanisms {COM(2003)403 final}“ (Brussels: EC, 23 July 2003) [EC extended impact assessment] Online: http://ec.europa.eu/governance/impact/docs/ia_2003/sec_2003_0785_en.pdf, p.21.

²⁸⁵ See *supra* p. 9.

²⁸⁶ See *supra* p. 18.

²⁸⁷ UNFCCC COP Decision 11/CP.7 D, paras 13-15.

²⁸⁸ UNFCCC COP Decision 17/CP.7, preamble.

²⁸⁹ Kyoto Protocol, Art. 6, Art 12 and Art. 17.

²⁹⁰ UNFCCC COP Decision 15/CP.7, whereby the COP “*Decides* that the use of the mechanisms shall be supplemental to domestic action and that domestic action shall thus constitute a significant element of the effort made by each Party included in Annex I to meet its quantified emission limitation and reduction commitments under Article 3, paragraph 1;”

sources, or an enhancement of removals by sinks, that is additional to any that would otherwise occur."²⁹¹

Allowing legal entities to trade in units internationally has several consequences triggered by the Protocol: First, every transaction of domestic units to a foreign party has to be 'backed up' by a transfer of AAUs between the respective Annex B states. This can occur by a simultaneous transfer of AAUs or by the use of allowances that were converted from AAUs and thus also have a dimension in public international law.²⁹² AAUs account for the total amount of emissions allowed to a party, and consequently cover all sectors of the economy, including the trading scheme as well as the non-trading sector (NTS). Consequently, reductions not achieved in the trading sector have to be made up for in the NTS, if a Party is to stick to its overall commitment. Membership to Kyoto²⁹³ thus should mitigate negative environmental effects potentially resulting from linking two schemes.²⁹⁴

Second, if trading with non-Annex-B parties is to occur, there can be no transfer of AAUs between those states. In case of an export of units to such a country, the Annex-B country has to merely cancel an AAU from its national registry. In case 'domestic currency' is exported, the cancellation would be environmentally sound, but is de iure not required, as such transfers are exclusively governed by the domestic law behind each trading scheme. In case of an 'import' of credits from such a scheme, no transfer of AAUs will take place, as the non-Annex-B country does not have an Assigned Amount of its own.

b) EU ETS

The EU system is a cap-and-trade scheme based on so-called 'EU allowances' that each represent one metric tonne of CO₂ equivalent.²⁹⁵ These credits are strictly limited

²⁹¹ Kyoto Protocol, Art. 6.1(b), Art. 12.5(c).

²⁹² Anthony Hobley & Peter Hawkes, "GHG Emissions Trading Registries", in: Freestone & Streck, *supra* note 5, p.127 [hereinafter "Hobley & Hawkes"] at 142.

²⁹³ This applies of course only in cases where a country does not deliberately decide to default on its Kyoto, obligations or simply fails to initiate appropriate economy-wide measures to address GHG emissions for a variety of reasons, compare Canada, Minister of the Environment Rona Ambrose, Speech "A Breath of Fresh Air: Made in Canada Solutions to Meet Canada's Environmental Challenges" (31 March 2006), Online: <http://www.ec.gc.ca/minister/speeches/2006/060331_s_e.htm>.

²⁹⁴ Blyth & Bosi, *supra* note 225, p. 23.

²⁹⁵ EC Directive 2003/87, *supra* note 17, Art. 3.

for use for the purposes defined in the Directive and are defined as only transferable according to the Directive.²⁹⁶ These allowances are allocated to operators of installations by the member states prior to a commitment period,²⁹⁷ making the EU approach a cap-and-trade system. In the 2005-2007 period, these allowances will be created from “thin air”, meaning without any international back-up behind them. In the 2008-2012 period, these allowances will be converted from member states’ AAUs.²⁹⁸ As a consequence, they will also have a compliance function in the EU ETS while retaining their status as Kyoto units under international law.²⁹⁹

In addition to these EU allowances, Kyoto ERUs and CERs are allowed into the EU scheme.³⁰⁰ CERs generated by CDM projects may be used for compliance already in the first trading period from 2005-2007, the use of JI-based ERUs is only permitted from the start of the second trading period (2008-2012) on.³⁰¹ CERs that have been used in the period 2005-2007 have to be cancelled subsequently.³⁰² Contrary to what was initially discussed, these will not be converted into EC units when entering the scheme, but keep their character as Kyoto units and be directly eligible for compliance.³⁰³ From the second trading period on Member states have to set limits on the use of JI/CDM credits by individual operators in their national allocation plans.³⁰⁴

Special provisions address the situation where a CDM/JI project is located in a new member state from the 2004 enlargement round.³⁰⁵ Project activities are generally supposed to be outside the scope of the trading scheme,³⁰⁶ if credits are nevertheless

²⁹⁶ *Ibid.*

²⁹⁷ *Ibid.*, Artt. 11.1 and 11.2.

²⁹⁸ EC, Commission Regulation (EC) No 2216/2004 of 21 December 2004 for a standardized and secured system of registries pursuant to Directive 2003/87/EC of the European Parliament and of the Council and Decision No 280/2004/EC of the European Parliament and of the Council (text with EEA relevance) [2004] O.J. L. 386/1, [hereinafter Registries Regulation] Art. 45, this applies also to subsequent periods, see *ibid.*

²⁹⁹ *Supra*, p. 51.

³⁰⁰ *Ibid.*, Artt. 11a and 11b; this inclusion of ERUs and CERs is based on a 2004 amendment to the original Directive (Directive 2004/101). The previous version that exclusively focused on EU allowances as the currency in an internal trading scheme, received criticism for its lack flexibility, see Hillebrand et al., *supra* note 32, p. 133.

³⁰¹ EC Directive 2003/87, *supra* note 17, Artt. 11a.1 and 11a.2.

³⁰² *Ibid.*, Art. 11a.2.

³⁰³ Jürgen Lefevere, “Linking Emissions Trading Schemes: The EU ETS and the ‘Linking Directive’” in: Freestone & Streck, *supra* note 5, p. 511 [Lefevere] at p. 524.

³⁰⁴ EC Directive 2003/87, *supra* note 17, Art 11a.1.

³⁰⁵ *Ibid.*, Art. 11b.1.

³⁰⁶ *Ibid.*, Art. 11b.2.

generated within the scheme's boundaries, they have to be compensated for by the cancellation of an equivalent number of EU allowances.³⁰⁷

'Pure' AAUs as well as RMUs are not directly eligible for compliance of legal entities.³⁰⁸ The EC refrained from imposing quantitative restrictions on the use of ERUs and CERs,³⁰⁹ but excluded certain categories of ERUs and CERs from the EU ETS. For the initial two trading periods all units generated from nuclear facilities are ineligible for compliance under the scheme.³¹⁰ Second, the EU has unilaterally decided to exclude credits from land use, land use change forestry activities,³¹¹ due to uncertainties of the environmental effect of such activities.³¹² There is further a reference binding member states to make sure that the substantive criteria of the "Dams and Development – A new framework for decision-making" of the World Commission on Dams as well as other relevant international criteria and guidelines are respected in large hydropower projects.³¹³

The EU approach does not allow for domestically generated offset credits to enter the trading scheme, but JI between EU member states remains an option, which leads to similar effects as domestic offset credits, although some restrictions apply.³¹⁴

c) RGGI

The basic unit in the RGGI scheme will be the 'CO2 allowance', which is initially allocated to 'CO2 budget units',³¹⁵ which makes RGGI a cap-and-trade system.

³⁰⁷ *Ibid*, Artt. 11b.3 and 11b.4.

³⁰⁸ Compare Blyth & Bosi, *supra* note 225, p. 19.

³⁰⁹ This was initially discussed, see EC extended impact assessment, *supra* note 284, at p. 39; the member states have to set out the amount of CERs and ERUs they intend to use in their National Allocation Plans, see EC Directive 2003/87, *supra* note 17, Art. 11a.1 and 2.

³¹⁰ Art 11a.3 (a) EC Directive 2003/87, *supra* note 17, Art. 11a.3(a), the rationale for this is the ineligibility of these units for Kyoto compliance based on the Marrakesh Accords, UNFCCC COP Decision 16/CP.7, before para.1 and UNFCCC COP Decision 17/CP.7, before para.1.

³¹¹ EC Directive 2003/87, *supra* note 17, Art. 11a.3 (b).

³¹² EC Directive 2004/101, *supra* note 113, recital 9; EC, Commission, „Commission Staff Working Paper – Extended Impact Assessment on the Directive of the European Parliament and the Council amending Directive establishing a scheme for greenhouse gas emissions allowance trading within the Community, in respect of the Kyoto Protocol's project based mechanisms {COM(2003)403 final}“ (Brussels: EC, 23 July 2003).

Online: http://ec.europa.eu/governance/impact/docs/ia_2003/sec_2003_0785_en.pdf, p.20.

³¹³ EC Directive 2003/87, *supra* note 17, Art. 11b.6, the projects must be larger than 20 MW.

³¹⁴ JI projects cannot be undertaken with participation from only one member state and requires approval by bodies assigned by the Kyoto Protocol and the Marrakesh Accords.

Interestingly, a ton of CO₂ equivalent as it is used in the RGGI scheme, is a so-called ‘short ton’ that equals 0.9072 metric tons.³¹⁶

Further, there will be credits awarded for offset projects, which are named ‘CO₂ emissions offset allowances’. Offset projects may be located in the RGGI states or any other US state which has entered into a memorandum of understanding on certain obligation with respect to offset projects with the respective regulatory authority in a RGGI state. CO₂ emissions offset allowances are also awarded to the “sponsor of a CO₂ emissions credit retirement that has satisfied all the applicable requirements [of RGGI]”,³¹⁷ RGGI allows for the use of offset credits for compliance purposes. Up to 3.3% of a sources’ compliance obligations can be covered by them. The Model Rule further defines two price-based trigger events: The coverage of up to 5 percent of emissions by offsets is allowed at a stage 1 trigger event³¹⁸, which is defined as a twelve month-period during which the average allowance price equals or exceeds a threshold price of USD 7.³¹⁹ Up to 10 percent are allowed at a stage two trigger event³²⁰, which is established as a stage one event, but with a threshold price of USD 10 per allowance.³²¹

The RGGI Model rule contains an exhaustive list of admissible offset project types.³²² All offset projects have to have been started after the end of 2005.³²³ Detailed standards are set for offset projects.³²⁴ Offset allowances are only to be awarded for projects that are additional to what would have happened anyway under “any local, state or federal law, regulation, or administrative or judicial order”,³²⁵ or is undertaken under a financial

³¹⁵ RGGI Model Rule, *supra* note 160, XX-1.2(v), one or more budget units are collectively referred to as ‘budget sources’ by XX.1.2(t).

³¹⁶ RGGI Model Rule, *supra* note 160, XX-1.2 (bh), definition of ‘ton’ or ‘tonnage’; XX-10.7(a)(2) contains a conversion rule for allowances/credits from systems functioning based on metric tons.

³¹⁷ *Ibid.*, XX-10.3(b).

³¹⁸ *Ibid.*, XX-6.5 (a)(3)(ii).

³¹⁹ *Ibid.*, XX-1.2 (bb) and (bc), the price is annually adjusted based on the changes in the federal Bureau of Labor Statistics Consumer Price Index.

³²⁰ *Ibid.*, XX-6.5 (a)(3)(iii).

³²¹ *Ibid.*, XX-1.2. (bd) and (be).

³²² *Ibid.*, XX-10.3(a)(1), these are: “(1) Landfill methane capture and destruction;(2) Reduction in emissions of sulfur hexafluoride (SF₆); (3) Sequestration of carbon due to afforestation; (4) Reduction or avoidance of CO₂ emissions from natural gas, oil, or propane end-use combustion due to end-use energy efficiency; (5) Avoided methane emissions from agricultural manure management operations; and (6) Reduction in emissions of methane from natural gas transmission and distribution equipment.”

³²³ Precisely, December 20, 2005, see RGGI Model Rule, *supra* note 160, XX-10.3(f).

³²⁴ *Ibid.*, XX-10.5.

³²⁵ *Ibid.*, XX-10.3 (d)(1), Eligibility of an offset project is ensured for one full allocation period, even if regulations change in the meantime.

incentive set by a public program.³²⁶ Offset allowances for projects with an electricity generation component are only granted if all additional public benefits flowing for the project are transferred to the respective regulatory authority.³²⁷ Ultimately, credits are not awarded for projects that generate units in any other greenhouse gas program.³²⁸

Offset allowances are awarded for an initial 10-year period with one option for a 10-year renewal period.³²⁹ For afforestation projects, credits may be issued for up to three 20-year periods.³³⁰

Offset allowances can also be issued for the retirement of credits that were issued by a mandatory ‘carbon constraining program’ with a cap from outside the US, as well as Kyoto-conforming emissions reduction credits are explicitly mentioned as eligible credit types for this kind of operation.³³¹ The conversion of external credits is only possible in the case of a ‘stage two trigger’ event.³³²

d) Canadian Large Final Emitter system

Two characteristics of the LFE have to be noted: The LFE system is a system based on a baseline, which again is established based on relative targets.³³³ So the LFE functions without an initial allocation of allowances to operators of installations. This implies that the allowed amount of emissions for an installation or an operator can only be calculated based on data of the previous emissions intensity and on the output within a certain compliance period, which amounts to an ex-post-determination of the allowed emissions. Operators have until a certain date of the year following a specific compliance year to remit the required units to the minister.³³⁴

This domestic credit system is complemented by a domestic offset system designed to generate quantifiable, real, surplus, verifiable emissions reductions that can be used for

³²⁶ *Ibid*, XX-10.3(d)(3).

³²⁷ *Ibid*, XX-10.3(d)(2).

³²⁸ *Ibid*, XX-10.3(d)(4).

³²⁹ *Ibid*, XX-10.3 (e)(1).

³³⁰ *Ibid*, XX_10.3(e)(2).

³³¹ *Ibid*, XX-10.3(b)(1).

³³² *Ibid*, XX-10.3(b)(2).

³³³ Compare para. 16 of Canada, Instructions Cross-cutting Provisions, *supra* note 146.

³³⁴ Canada, Instructions Cross-cutting Provisions, *supra* note 146, at para. 7 sets September 30th as the relevant date, but also see Canada, Notice of intent, see *supra* note 147, at para. 4.1. speaks of December 31st.

internal compliance,³³⁵ traded³³⁶ or be bought up by a Fund in order to ensure Canada's Kyoto compliance.³³⁷ These are explicitly described as an instrument of domestic policy that serves to attain domestic policy objectives.³³⁸ Offset credits refer to reductions in GHGs by individuals, businesses and other organizations that are not covered under the LFE regime. For the generation of offset credits to count toward emissions reduction target, four conditions must be satisfied. The emissions reduction must be quantifiable, real, verifiable and the seller of the offset credit must not have secured its reduction by virtue of a specified federal greenhouse gas regulation program, or incentive (additionality).³³⁹

Offset credits generally were to be Kyoto-compatible as offset projects must result in greenhouse gas reductions or removals from sources or sinks that are included in Canada's inventory for Kyoto compliance.³⁴⁰ However, the government was envisaging some exceptions.³⁴¹ Eligible projects were to have started after January 1st, 2000.³⁴²

The project approval process was mainly to be based on the ISO 14064-2 standard, as well as on the Greenhouse Gas Protocol issued by the World Resource Institute (WRI) and the World Business Council on Sustainable development (WBCSD).³⁴³ The Canadian Government proposed to make considerable efforts to simplify the quantification process by using pre-determined factors for certain projects.³⁴⁴ Long-term- as well as short-term credits were supposed to be available.³⁴⁵ However, the length of the liability period for long-term credits as well as the possible number of years for which temporary credits could be issued, remained to be set.

³³⁵ Technical Background Document Offsets, see *supra* note 279, Overview section, p. 4.

³³⁶ Technical Background Document Offsets, see *supra* note 279, Overview section, p.5.

³³⁷ Technical Background Document Offsets, see *supra* note 279, Overview section, p. 5.

³³⁸ *Ibid.*

³³⁹ Technical Background Document Offsets, see *supra* note 279, pinpoint 41,42.

³⁴⁰ Technical Background Document Offsets, see *supra* note 339 pinpoint 26.

³⁴¹ Technical Background Document Offsets, see *supra* note 339, para. 28.

³⁴² Technical Background Document Offsets, see *supra* note 339, para. 31.

³⁴³ Inside Canada, the CSA would have served to approve standard Protocols which would have been to be validated by the Offset Program Authority.

³⁴⁴ In particular with respect to agricultural sinks, landfill gas capture and small non-emitting energy projects.

³⁴⁵ Technical Background Document Offsets, see *supra* note 279, para. 157 and following.

In addition to this, all types of Kyoto units are allowed into the Canadian scheme and they will all be eligible for domestic compliance purposes.³⁴⁶ The only restrictions were that AAUs had to be “greened” in order to be eligible for compliance³⁴⁷ and that the use of CERs was limited to 30% of an emitter’s required compliance units.

e) Other examples

In the Norwegian scheme, domestic allowances will be tradable. Other scheme’s allowances and domestic offset credits can be admitted into the scheme by royal regulations,³⁴⁸ but so far such regulations have not been issued.³⁴⁹

The basic trading unit of the CCX is the ‘Carbon Financial Instrument’ (CFI), a contract representing 100 tons of CO₂ equivalent. CFIs are issued to companies based on their baseline and for offset projects that can be based worldwide.³⁵⁰ As there is an initial allocation to companies, the CCX is a cap-and-trade approach. Offset credit generation is limited to a predefined set of project types, which include projects eligible for the CDM.³⁵¹ The CCX is committed to use the GHG Protocol by the WRI and WBCSD for its emissions calculations.³⁵²

The NSW scheme works by establishing a baseline based on the electricity-related CO₂ emissions per capita (benchmark), the total electricity demand in the state and the individual participant’s market share.³⁵³ Credits, which are called Abatement Certificates in the scheme, can only be generated by registered providers for a limited number of

³⁴⁶ Canada, Instructions Cross-cutting Provisions, *supra* note 146, at para 1, AAUs are subject to certain further eligibility restrictions under a *Canada Emission Reduction Incentives Act*, which does not seem to have been adopted yet, but see *Canada Emission Reduction Incentives Agency Act (2005) c.30 s.87*.

³⁴⁷ Canada, Notice of intent, see *supra* note 147, at para. 3; “Greening of AAUs means ensuring that they are actually not corresponding to hot air, which means emissions units not related to economic activity, which is particularly a problem of the AAUs of Russia and Ukraine. “Greening” is supposed to occur by either linking the AAUs to real reduction projects before they can be sold (‘hard greening’) or to the adoption of certain environmental policies by the seller country (‘soft greening”).

³⁴⁸ Greenhouse Gas Emissions Trading Act, *supra* note 152, paras. 14 and 15.

³⁴⁹ See Norwegian law database lovdata, online: <http://www.lovdata.no/for/sf/md/krono.html>.

³⁵⁰ The CCX mainly counts on projects in the United States, Canada, Mexico and Brazil, see online: <http://www.chicagoclimatex.com/about/features.html>.

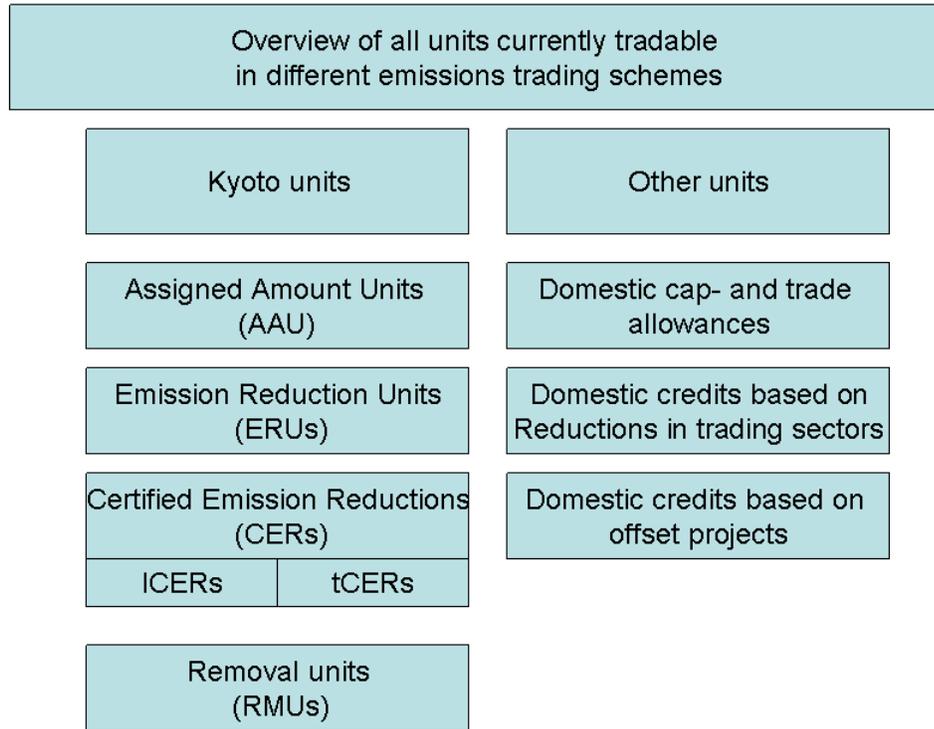
³⁵¹ These are methane destruction, agricultural practices, forestry practices, other GHG emission mitigation in Brazil, renewable energy as well as projects eligible for the Clean Development Mechanism, see online: <http://www.chicagoclimatex.com/about/program.html>.

³⁵² Presentation of the Chicago Climate Exchange by Michael J Walsh, Senior Vice President of the CCX, p. 20., see online: <http://www.eesi.org/briefings/2005/Climate%20&%20Energy/4.25.05CarbonTrade/Walsh4.25.05.pdf>.

³⁵³ Electricity Supply Amendment Act 2002, *supra* note 269, § 97BC.

abatement activities.³⁵⁴ No credits are generated if a benchmark participant lowers its emissions more than required.

f) Overview of existing unit types



g) Findings

The CDM becomes a standard for offset credits also outside the scope of Annex-B countries. Standardization will likely have a more pronounced role with respect to carbon measurements and accounting, in particular with respect to offset credit generation. The WRI-WBCSD GHG Protocol³⁵⁵ and the GHG Protocol for Project Accounting³⁵⁶ are

³⁵⁴ Introduction to the GGAS, p.9, the relevant activities are: electricity generation at a low emissions intensity, improvements of the efficiency of electricity generation, demand side abatement, reductions by large users that are unrelated to electricity consumption (the generated credits are non-transferable), and carbon sequestration projects.

³⁵⁵ World Business Council for Sustainable Development & World Resource Institute, “The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard” (2004), online: <<http://www.ghgprotocol.org/DocRoot/sA&d8PHg3bcUOqFFYFDO/ghg-protocol-revised.pdf>>; The Protocol was first launched in 2001 and is now available in revised form.

used by different schemes and thus likely to at least influence future standard-setting with respect to emissions calculation, reduction projects and verification.³⁵⁷ Environmental restrictions of unit trading have taken place in different schemes (e.g. EU ETS)

h) Legal gateways against ‘hot air’

The avoidance of importing ‘hot air’, which means emissions rights not reasonably linked to economic activity, has been one of the major concerns in the debates on linking between Annex B states.³⁵⁸ ‘Hot air’ is a particular problem with respect to Russia and other countries in Eastern Europe. It shall serve as the exemplary case for all sorts of safeguards against allowances that are not generated in an environmentally sound way.

As we have previously seen, linking will potentially undermine safeguards against certain unit types by the single ETS, as there will be incentives to replace them with other unit types in order to make profits. Only if linked schemes collectively banned certain units from use for compliance, this problem could be addressed. As we see in the example of the EU ETS, non-converted AAUs are not suitable for use for compliance by emitters, which essentially means that AAU trading remains under government control. The case is different, if AAUs are allowed for compliance, as it was proposed in the Canadian scheme. Equally, if a country with ‘hot air’ was to set up a domestic trading scheme, the AAUs would potentially flow into the linked scheme as the ‘backup’ to the foreign allowances. Different proposals have been made to address this problem, including the ‘greening’ of AAUs, which means allowing for trade in AAUs only in association with either ‘Track One’ JI Emissions Reductions or other GHG-reducing activities additional to what would otherwise have happened.³⁵⁹

³⁵⁶ World Business Council for Sustainable Development & World Resource Institute, “The GHG Protocol for Project Accounting” (2005), online:

<<http://www.ghgprotocol.org/DocRoot/sA8d8PHg3bcUOqFFYFDO/ghg-protocol-revised.pdf>>.

³⁵⁷ Compare comments of WRI/WBCSD on ISO 14064-1, that indicate that the standard even refers its users to the GHG Protocol for further guidance, online: <

<http://www.ghgprotocol.org/DocRoot/sA8d8PHg3bcUOqFFYFDO/ghg-protocol-revised.pdf>>.

³⁵⁸ Väyrynen, Jari & Lecocq, Franck, “Track One JI and ‘Greening of AAUs’: How Could it Work?”, in Freestone & Streck, *supra* note 5, p. 155 [hereinafter: Väyrynen & Lecocq], at p. 163, according to different estimates (see *ibid.*, p. 164), there will be between 1,337 and 1,385 Mt of CO₂ equivalent of hot air from the economies in transition in Eastern Europe.

³⁵⁹ *Ibid.*, p. 165-167.

There would also be the possibility of quantitative limitations of trading with ‘hot air’ countries, but they play no role in the current schemes and linking efforts.³⁶⁰ This would, however, still allow considerable amounts of hot air being traded, which would reduce environmental integrity of the Kyoto framework and distort the formation of a unit price reflecting marginal abatement cost.³⁶¹ A further approach would be imposing some form of tax or duty on imported units would make them less attractive to buy in the first place. If, however, the demand for hot air units would fall below a certain threshold, their prices would drop too, which might make purchasing them an option for domestic buyers again. Relative discounting of imported units could be an option allowing to address the lower environmental value or certainty of imported units,³⁶² and to address uncertainties. As long as there is some reduction connected to the imported units, the environmental effect of this gateway should be positive. Its economic effect, on the other hand, may be detrimental, as a conversion rate could likely have a prohibitive effect on unit imports.³⁶³ Overall, the hot air problem does not seem resolved satisfyingly so far.

i) Legal Gateways designed to remedy different rules on unit generation and recognition

Capped and rate-based schemes: As it is likely that allowing unrestricted trade between capped and rate-based scheme leads to higher overall emissions,³⁶⁴ linking a scheme with an absolute emissions target with a scheme with a relative target will require a gateway restricting credits from entering the capped scheme. Such a gateway has historically been used in the UK scheme,³⁶⁵ where influx was set to zero.³⁶⁶ There could,

³⁶⁰ Victor, *supra* note 68, p 115; see also position taken in EC, European Commission, *Green Paper on greenhouse gas emissions trading within the European Union*, COM(2000)87, (Brussels, EC Commission 8 March 2000), online: EC <http://eur-lex.europa.eu/LexUriServ/site/en/com/2000/com2000_0087en01.pdf>.

³⁶¹ *Ibid.*

³⁶² Should there be any. In the case of pure ‘hot air’ under the Kyoto Protocol, the AAUs do not represent any environmental value. So this example is more valid for cases where, for example, a certain level of double counting in a scheme can be assumed or where there is insecurity about the quality of the monitoring, reporting and verification methodologies in a certain scheme; see also Victor, *supra* note 68, at p.111.

³⁶³ This would depend on its level. Regulators would also face the problem of determining the right level of the conversion rate, a problem that Fischer, see *infra* next footnote, has pointed out for project-based mechanisms.

³⁶⁴ Carolyn Fischer, *Combining rate-based and cap-and-trade emissions policies*, (2003) *Climate Policy* 3S2 89 [Fischer] at p.91, she points out the importance of market interactions between the two schemes.

³⁶⁵ Haites & Mullins, *supra* note 90, at p. 49.

however be a possibility for trading if the relative scheme would be able to demonstrate that it had generated actual reduction against a verifiable baseline.³⁶⁷ Trading under these conditions, however would only be possible after the end of the compliance period of the relative scheme. This problem might be overcome by intermediaries creating options on the purchase of credits from certain firms, the value of which would be determined by ongoing monitoring of emissions of the firms as well as the scheme as a whole.

Three other gateways that would allow for trading and could be unilaterally imposed by the regulator of the capped scheme have been identified by *Fischer*: Taxing output in the rate-based scheme, imposing an exchange rate on permits from the rate-based scheme and tightening of the cap in the capped program.

A tax on output would certainly serve to restrict output and thereby emissions in the rate-based sector, but would encounter serious difficulties with respect to the WTO trade disciplines.³⁶⁸ A regulator imposing an exchange rate would face the problem of setting the right level of that rate. In addition, an exchange rate would lower economic efficiency of the overall scheme, as the equalizing of marginal abatement cost, which is essential for maximized gains from trade, would be distorted.³⁶⁹ This option may nevertheless be an important policy option to create incentives for policy change in the other scheme.³⁷⁰ Lowering the cap level in the capped scheme will potentially not be attractive to the regulator, as it will put its own industry at a competitive disadvantage that will hardly be trumped by gains from increased trade with the rate-based sector.³⁷¹ Overall, the difficulties in this linking scenario weigh very heavy. **The regulator of a capped scheme consequently should avoid linking into a rate-based scheme.**

³⁶⁶ Fischer, *supra* note 364, at p. 101 nevertheless concludes that also this expands total emissions if trades occur.

³⁶⁷ Haites & Mullins, *supra* note 90, at p.49, who assume that it would have to be proved that the reductions achieved were larger than those in the capped scheme. This in my view is not a precondition for linking. There would still be a net positive environmental effect, if both schemes achieved at least some reductions.

³⁶⁸ Fischer, *supra* note 364, at p.101.

³⁶⁹ Fischer, *supra* note 364, at p.102.

³⁷⁰ The WTO dispute settlement is not favorable of measures designed to force policy changes in other countries. But as this measure does only concern permit trade, not the underlying product markets, there is only a small probability of a WTO challenge against such a measure; compare Jinnah, *supra* note 207, p. 737; and *United States – Restrictions on imports of Tuna (complaint by EEC)* (1994), GATT Doc. DS29/R, unadopted, 33 I.L.M 839, online: <<http://www.intfish.net/cases/other/gatt1994/report.pdf>> [Tuna/Dolphin II].

³⁷¹ Fischer, *supra* note 364, p.102.

Kyoto membership should be an incentive to achieve absolute reductions and should make an intensity-based scheme a rather unattractive option.

Project-based mechanisms: Legal gateways between trading schemes project-based mechanisms, domestic or international, must ensure several standards to maintain environmental integrity: there must be a credible process of baseline- and boundary-setting for projects, as well as credible monitoring and verification of actual reductions achieved by the project. Further, double counting has to be avoided, in particular with respect to projects that involve zero-carbon electricity generation (renewables) as well as improvements in the efficiency of electricity use.³⁷²

The Kyoto flexible mechanisms: The JI and CDM have a standardized system in place that will make trading of ERUs and CERs between Kyoto parties easy. The coming years will show, if sufficient environmental credibility was achieved by the existing CDM procedures. CDM and JI already come with very developed methodologies regarding additionality of reductions,³⁷³ monitoring, environmental impact assessment and public participation.³⁷⁴ Nevertheless, some scheme regulators may desire to reduce the accessibility of CDM credits for compliance purposes in their schemes.³⁷⁵ As Kyoto does not regulate the rules of domestic trading schemes, such restrictions are in full compliance with the Protocol. Units could even be rejected on a case-by-case base,³⁷⁶ A way around this may be to formulate abstract criteria with respect to environmental performance or sustainable development that allow for the acceptance of credits. Such an approach may strongly increase transaction cost and reduce economic efficiencies in the market. What seems feasible, is an ‘emergency safeguard’ approach that can be put in place in case that there is strong evidence of fraud or incompetence in the JI/CDM credit issuance processes. Such a process would guarantee the environmental integrity of the

³⁷² Bygrave, Stephen & Bosi, Martina, “Linking Project-Based Mechanisms with Domestic Greenhouse Gas Emissions Trading Schemes” (Paris: OECD/IEA, 2004)
online: OECD <<http://www.oecd.org/dataoecd/38/8/32181359.pdf>> [Bygrave & Bosi] p. 23.

³⁷³ There are requirements regarding baseline-setting, definition of project boundaries and leakage adjustments, See UNFCCC COP Decision 17/CP.7, Annex para. 37(d), 43,44,51,52.

³⁷⁴ UNFCCC COP Decision 16/CP.7, Annex, Appendix B and 17/CP.7, Annex, Appendix B,C.

³⁷⁵ As the EU does it for LULUCF credits in the first Kyoto period.

³⁷⁶ EC Directive 2003/87, *supra* note 17, Art. 30. although this might cause litigation problems with emitters invoking their legitimate expectation of having access to such units.

domestic scheme, but also undermine the credibility of the flexible mechanisms and the Kyoto approach as a whole³⁷⁷, at least if frequently used.

Domestic project-based mechanisms: With respect to domestic offsets, the respective regulator will, if he has a Kyoto commitment, seek to ensure that projects ultimately produce real reductions in the national emissions inventory of the country. The choice of the right performance standard is of high importance here.³⁷⁸ Global standards issued by the International Organization for Standardization (ISO) and other actors may make an important contribution to facilitate the integration of different project-based mechanisms.³⁷⁹

III.Part 3: Global and individual caps - Target-setting and allocation of emission rights to entities

Within each scheme it has to determine who sets the overall emissions targets of the scheme and what approach to targets is taken. As a second step, emission rights must be allocated to single entities according to certain rules.

1. The setting of overall targets

Overall targets can be determined by a central regulator or by regional sub-regulators, as well as by emitters or groups of emitters themselves. The types of targets adopted can also substantially differ. The main options are to set a long-time emissions trajectory in order to achieve predictability of the market or to set new targets periodically. The stringency of the targets is of fundamental importance to the environmental effectiveness of a scheme. Targets can be either expressed in absolute emissions reductions or in relative targets or intensity targets, i.e. the emissions intensity of a certain emitter per some measure of economic activity such as output, turnover or GDP.³⁸⁰

³⁷⁷ Compare Ernestine Meijer & Jacob Werksman, “Keeping it Clean – Safeguarding the Environmental Integrity of the Clean Development Mechanism”, in: Freestone & Streck, *supra* note 5, p. 191, at p. 192, where the authors point out that the more successful the CDM is in terms of generating reductions, the more the credibility of the Kyoto reduction effort as a whole depends on its rules, as more and more reduction commitments in developed countries will not be achieved domestically any more, but through the CDM.

³⁷⁸ Bygrave & Bosi, *supra* note 372, at p. 28; Harri Laurikka, “Absolute or Relative Baselines for JI/CDM projects in the Energy Sector?”, *Climate Policy* (2): 19.

³⁷⁹ See *supra* p. 1.

³⁸⁰ Benito Müller & Alexander Michaelowa & Christian Vrolijk, “Rejecting Kyoto – A study of proposed alternative to the Kyoto Protocol” (*Climate Strategies*, 2001), online: HWWA

The relative stringency of targets between different schemes will generally lead to some distortion of competition, as allocations for similar installations are unlikely to be the same.³⁸¹ This effect is independent of linking. Further, linking a scheme with another scheme that has a very low stringency of targets, will likely increase overall emissions and thus lower the environmental effectiveness of the combined scheme.³⁸² It also matters, for what time-frames targets are set and which authority is in charge of setting targets.

Ultimately, the determination of caps for all participating schemes by a central authority would be the preferable way to prevent all sorts of gaming by participants. Such an approach has not been successfully implemented to date. At least different cap levels and cap-setting methodologies should be taken into account when linking. Some approaches come without a cap, but installing ‘gateways’ to such schemes may nevertheless be possible.³⁸³

Project-based mechanisms like the CDM are defined by the absence of an emissions cap, as they do not relate to whole sectors of the economy, but rather to single installations.³⁸⁴ Therefore the methods chosen to establish an emissions baseline and avoid emissions leakage are of major importance here. They constitute the necessary ‘gateway’ between a capped scheme and reduction projects.

<[http://www.hwwa.de/Projekte/Forsch_Schwerpunkte/FS/Klimapolitik/PDFDokumente/Mueller,%20Micha%20Vrolijk%20\(2001\).pdf](http://www.hwwa.de/Projekte/Forsch_Schwerpunkte/FS/Klimapolitik/PDFDokumente/Mueller,%20Micha%20Vrolijk%20(2001).pdf)>, at p. 9.

³⁸¹ Blyth & Bosi, *supra* note 225, p. 24; see above section on emissions trading in an open world economy, *supra* p. 12.

³⁸² Blyth & Bosi, *supra* note 225, p. 24 are rightly pointing out that this effect will only occur if targets in one scheme are set above BAU emission levels.

³⁸³ See *supra* p. 64.

³⁸⁴ See generally criticism of this concept by Christiana Figueres, “Sectoral CDM: Opening the CDM to the Yet Unrealized Goal of Sustainable Development”, (2006) JSDLP 2:1, p. 5-25; She favors the concept of a sectoral CDM in order to avoid the perverse incentive of not passing emissions-restraining regulation in order to gain revenue from CDM credits out of single projects; The CDM, in addition to that, today is only applied at a larger scale in certain world regions, particularly in India, China, Brazil and Mexico. It does therefore fulfill its development promises only to a limited extent, see UNFCCC website, online: <<http://cdm.unfccc.int/Projects/MapApp>>.

a) Kyoto Protocol

The Kyoto Protocol targets were adopted in a process of international negotiations. Hence, they are mainly politically determined and do not necessarily reflect what is environmentally desirable.³⁸⁵

b) EU ETS

In the EU ETS, the target of the EU as a whole is determined by the Kyoto Protocol, whereas the individual targets of the member states are based on a so-called Burden Sharing Agreement ('BSA').³⁸⁶ This burden sharing arrangement between the member states does not determine a cap for the total emissions of the member state to be allocated in the trading scheme. The reductions to be made by the individual member states have to be achieved by emissions trading as well as by contributions from the non-trading sectors ('NTS') and there is no correlation between both sectors contributions prescribed. This results in the full competence of the member states to determine the overall cap for their trading sector.³⁸⁷ Annex III of the Directive 2003/87 only states that:

“The total quantity of allowances to be allocated for the relevant period shall be consistent with the member state’s obligation to limit its emissions pursuant to Decision 2002/358/EC [which contains the adoption of the Kyoto Protocol by the EC and the Burden Sharing Agreement] and the Kyoto Protocol, taking into account, on one hand, the proportion of overall emissions that these allowances represent in comparison with emissions from sources not covered by this Directive and, on the other hand, national energy policies, and should be consistent with the national climate change programme. The total quantity of allowances allocated shall not be more than is likely to be needed for the strict application of the criteria of this Annex. Prior to 2008, the quantity shall be consistent with a path towards achieving or over-achieving each Member State’s target under the decision 2002/358/EC and the Kyoto Protocol.”

³⁸⁵ This is a critique often voiced, see Meinhard Doelle, “Critical Notice: The Kyoto Protocol: Reflections on its Significance on Occasion of its Entry into Force” (2004) 27, *Dalhousie L. J.* 555.

³⁸⁶ EC, *Council Decision of 25 April 2002 concerning the approval, on behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the joint fulfilment of commitments thereunder* [2002] O.J. L. 130/1.

³⁸⁷ EC Directive 2003/87, *supra* note 17, Art. 9.1; cite criticism by Kurkowski, *supra* note 66, at p. 708.

Ultimately, the EC lacks the competence for setting ‘hard targets’ for member states.³⁸⁸ The targets for 2005, the first period for which verified emissions data is available so far, were mostly set visibly higher than actual emissions.³⁸⁹

c) RGGI

The RGGI scheme is based on caps on two levels which are both determined in the MOU. First, there is an absolute regional emissions cap³⁹⁰ and second, absolute caps for the participating states.³⁹¹ These caps are scheduled to remain at the same level for the first six years of the operation of the scheme and shall then decline by 2.5% yearly in relation to the initial cap for four years.³⁹² It remains yet to be determined whether there will be further reductions goals after 2018.³⁹³

d) Canadian Large Final Emitter system

Canada was planning a 15% reduction in emissions intensity from a 2010-business-as-usual forecast for all sectors included in the scheme, excluding certain so-called fixed-process emissions from any necessity to make intensity reductions.³⁹⁴ For the target-setting for the period from 2008-2012 (the first trading period of the LFE system), there were supposed to be negotiations of the federal level with provinces and other stakeholders.³⁹⁵ For the time after 2012, the Notice of Intent set out a comparative consultative process as well as several criteria for the determination of longer-term

³⁸⁸ Kurkowski, *supra* note 66, at p. p. 701; “EC admits No Legal Basis to Demand Scarcity in ETS”, POINT CARBON, Aug. 16. 2004, cited after Kurkowski, *supra* note 66, at note 46; Article 175.2 EC Treaty allows the Community to take environmental measures of a “primarily fiscal nature” or “measures significantly affecting a Member State’s choice between different energy sources and the general structure of its energy supply.”; this head of power, however, requires unanimity in the Council and has therefore not been employed to set up the EU ETS.

³⁸⁹ See EC press release website, online :

<<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/612&format=HTML&aged=1&language=EN&guiLanguage=en>>.

³⁹⁰ RGGI MOU para.2.B.

³⁹¹ *Ibid*, para 2.C.

³⁹² *Ibid*, para. 2.D.

³⁹³ *Ibid*, para. 2.D.

³⁹⁴ Canada, Notice of intent, see *supra* note 147, para. 2.1

³⁹⁵ Compare to Canada, Notice of intent, see *supra* note 147, para. 1.1, which states “The Government would work on the development of the proposed LFE regulations through a full partnership with provinces and territories and in consultation with industry, ENGOS, and other stakeholders [...]”.

targets.³⁹⁶ The approach of having targets set by the federal level will exclude possibilities for the provinces to cheat on behalf of their industries, but on the other hand, negotiations between the federal level and the provinces are likely to be difficult.

e) Other examples

The total number of allowances will be set by the King (the administration) in the Norwegian example. The Act names several criteria to be taken into account in this process: “Norway’s international commitments to reduce greenhouse gas emissions, actual and projected emissions in Norway, the proportion of actual and projected emissions that come within the scope of section 3, the fact that discrimination between sectors and enterprises should be avoided, and the technological and economic potential for reducing emissions that come within the scope of section 3.”³⁹⁷

When joining the CCX, emitters sign up for a predefined schedule of reduction commitments until 2010 based on a baseline set based on average emissions from 1998 to 2001.³⁹⁸ The reduction to be achieved by 2010 is 6 percent compared to the baseline.³⁹⁹ Further reduction commitments have not been fixed yet, but it has to be assumed that they would depend on a consensus of the participating emitters.

The NSW GGAS sets a benchmark targets declining from 2003 to 2007 and then remaining constant until 2012.⁴⁰⁰

f) Findings

It can be observed that most of the examined systems have their targets entirely set by sub-entities or at least allow for the participation of sub-entities. The EU is equipped with a central authority, but it lacks the necessary powers to set an overall cap. In the context

³⁹⁶ Canada, Notice of intent, see *supra* note 147, para 2.3: “[...]Targets for the period beyond 2012 would be determined by the Government in partnership with provinces and territories, and in consultation with industry, NGOs, and other stakeholders. Possible criteria that could be used to determine specific longer-term targets include the most current scientific evidence; consistency with long-term national climate change objectives and energy policy, aim to make Canadian industry best-in-class; Canada’s international obligations; and recognition of sectoral capabilities, relative compliance costs and other competitiveness considerations.”

³⁹⁷ Greenhouse Gas Emissions Trading Act, *supra* note 152, at para. 6.

³⁹⁸ See online: <<http://www.chicagoclimatex.com/about/program.html>>.

³⁹⁹ *Ibid.*

⁴⁰⁰ Electricity supply Amendment Act 2002, *supra* note 269, § 97B; this represents a five percent reduction with respect to the 1990 Kyoto Protocol baseline, see Introduction to GGAS, p. 5.

of RGGI, caps for all participating states have been agreed upon, but they are not binding unless implemented in state law. A central authority cannot be established due to US constitutional provisions and ultimately the agreed numbers are based on negotiations between the participating states.

These observations indicate that a lack of centralization in the first place may tend to lower the environmental performance of every single scheme, but can also reduce the performance in case of linking if laxity is too high. Regulators linking into another scheme will have to weigh the potential economic gains of trading with a scheme having a large surplus of credits against their domestic and international environmental commitments. **From an environmental point of view, it is not advisable to link into a scheme without a cap requiring real reductions from the covered sectors.** Targets so far are set for only relatively short timeframes, mostly until the end of the Kyoto Commitment period. Longer timeframes would be preferable, also for linked schemes, as they increase the certainty for industry and decrease incentive to game for more favorable conditions in subsequent periods.

2. Allocation Methodology – to installations

The method of allocation of emissions rights to the participating emitters has to be determined by every emissions trading scheme. There are two approaches to do it: First can be done based on historical emissions of an installation (grandfathering), second based on the auctioning of emissions rights. Grandfathering is suitable for cap-and trade as well as for baseline-and-credit schemes. The cap per installation is based on some figure of historic absolute emissions of the emitter or on projections of future emissions (business-as-usual, BAU) used to establish the number of permits to be allocated or the relevant baseline. In the baseline example, there is no actual allocation taking place until the performance against the baseline is determined at the end of the compliance period and credits are eventually issued. In a cap-and-trade-system, there is a second method of doing the initial allocation in a cap and trade system is to sell emission rights via an auction. Combinations of both approaches, i.e. auctioning of a part of the permits are also possible. The initial allocation in a trading scheme constitutes an act of distribution of wealth, but does not determine the later price of emissions allowances and credits in the

scheme.⁴⁰¹ Thus, differences in initial allocation should not influence the linking of two trading schemes.

The picture looks different for subsequent allocations for new commitment periods, and the treatment of installation closures and new entrants.⁴⁰² If the base year of allocation for a subsequent period is set in the preceding period, there may be an incentive for companies to not reduce their emissions in the first period, especially if they expect higher allowance prices in the second period.⁴⁰³ In a linked scheme, there would likely be access to more cheap allowances to cover excess emissions, which would make this type of gaming easier.⁴⁰⁴ The environmental performance would be lowered in the scheme with higher abatement cost in both periods, and potentially also in the other scheme in the second period, as there may be too many allowances in the overall scheme.

The treatment of new emitters entering the market or ceasing operations must also be addressed. In cases of plant closure, the operator must be prevented from receiving allowances. Such allowances constitute ‘hot air’ which would lower prices in the overall market and thereby also lower the incentive to comply.⁴⁰⁵ If allocation to new entrants in another scheme is free of charge, there may be an incentive to move production to this scheme’s jurisdiction. But this incentive is independent of linking.⁴⁰⁶ If allocation of new entrants is very generous in one scheme⁴⁰⁷, again, the environmental effectiveness of the overall scheme will suffer.

The problem of initial allocation does not occur in baseline schemes. On the other hand, the number of credits available can, similar to an intensity-based approach, only be determined at the end of compliance period. Again, one possible remedy that could allow

⁴⁰¹ Blyth & Bosi, *supra* note 225, p. 25 – the price is rather dependant on how many allowances were allocated, not on how they were allocated; compare also Woerdman, *supra* note 43, at p. 368, 372, 373: the author points out that a firm receiving gratis allocation does in fact not have a competitive advantage over a firm that has to buy allowances in an auction, as the former has to bear the opportunity cost of using the allowances to cover his emissions. The former firm will, however, have more financial resources at its disposal, see *ibid.*

⁴⁰² Blyth & Bosi, *supra* note 225, p. 25.

⁴⁰³ Blyth & Bosi, *supra* note 225, at p. 26; compare also Baron, Richard & Bygrave, Stephen, “Towards International Emissions Trading: Design Implications for linkages” (Paris: OECD/IEA Information Paper, 2002), online: OECD <<http://www.oecd.org/oecd/pages/home/displaygeneral/0,3380,EN-document-517-nodirectorate-no-21-32543-8,00.html>> [Baron & Bygrave], at p. 10.

⁴⁰⁴ *Ibid.*, p. 26; but keep in mind that this only applies for the scheme with the previously higher abatement cost.

⁴⁰⁵ Blyth & Bosi, *supra* note 225, at p.26.

⁴⁰⁶ *Ibid.*

⁴⁰⁷ For example if allocation is not based on best available technology emissions standards.

for trading with a cap-and-trade scheme is trade in options instruments can allow for sufficient market liquidity and help avoid disadvantages for emitters in the baseline scheme.⁴⁰⁸

a) Kyoto Protocol

As the Kyoto Protocol does not mandate the establishment of domestic emissions trading systems nor any of the rules to be contained in them. Allocation methodologies are thus outside the focus of the Kyoto Protocol.⁴⁰⁹

b) EU ETS

The allocation of allowances to individual installations has to be based on National Allocation Plans (NAPs) of the member states, which have to be approved by the EC Commission. There will be one NAP per trading period. The Commission has issued guidance with respect to the allocation methodology, but it is of non-binding nature.⁴¹⁰ The actual allocation practice of the member states has been criticized as lacking consistency and equity⁴¹¹ and to invite lobbying and litigation aiming and changing the outcome.⁴¹² There is no rule demanding that similar installations in different member states receive similar allocations of allowances. This has raised competitiveness concerns, for example in Germany.⁴¹³ In the first allocation periods, it seems that there was

⁴⁰⁸ See preceding paragraph.

⁴⁰⁹ The only weak reference in the Protocol to this issue is the enabling language of the Marrakesh Accords concerning the inclusion of legal entities in emissions trading which indicates that the Protocol is not opposed to allocation to legal entities, UNFCCC COP Decision 18/CP.7.

⁴¹⁰ EC, Commission, *Communication on guidance to assist Member States in the implementation of the criteria listed in Annex III to Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC and on the circumstances under which force majeure is demonstrated, (COM(2003) 830 final)* [2003] not published in the Official Journal, online: EC <http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type_doc=COMfinal&an_doc=2003&nu_doc=830>, paras. 48 to 64;

as well as EC, *Communication From The Commission To The Council And To The European Parliament on Commission Decisions of 7 July 2004 concerning national allocation plans for the allocation of greenhouse gas emission allowances of Austria, Denmark, Germany, Ireland, the Netherlands, Slovenia, Sweden, and the United Kingdom in accordance with Directive 2003/87/EC* [2004] not published in the Official Journal, online: EC <http://europa.eu.int/eur-lex/en/com/cnc/2004/com2004_0500en01.pdf>.

⁴¹¹ Hillebrand et al., *supra* note 32, p.40, 41.

⁴¹² Compare Kurkowski, *supra* note 66, p.711.

⁴¹³ Hillebrand et al., *supra* note 32, p. 40, 41, the authors also criticize the bureaucratic cost of control of national allocation plans by the EC Commission.

substantial over-allocation by the member states which caused allowance prices to drop to a very low level in 2007.⁴¹⁴

Member states have the right, but no obligation to auction a part of the permits, 5% for the first trading period, 10% for the second period. Only four member states made use of auctioning.⁴¹⁵ There is an obligation to allocate part of the permits only after February 28th of the respective commitment period.⁴¹⁶ Member states also have some discretion to set aside allowances for new entrants in the initial allocation process⁴¹⁷ and are expected to have methodologies in place for the allocation to new entrants that ensures an equal treatment of new entrants.⁴¹⁸ Member states may include information on rewards for early action in the NAPs.⁴¹⁹

c) RGGI

The allocation of allowances to operators of installation is left to the participating states with one important exception: The states agree in the MOU that 25% of the allowances will be allocated for a consumer benefit or strategic energy purpose.⁴²⁰ So there is one important revenue-recycling element built into RGGI. Signatory states of RGGI may grant early reduction allowances (ERAs) for projects undertaken in the time between the signing of the MOU and the start of the scheme.⁴²¹ ERAs may be awarded for reductions achieved in the period 2006-2008. Facility shutdowns do not qualify for the award of early reduction credits and new facilities have to be accounted for, even if they did not exist in a 2003-2005 baseline period.⁴²²

d) Canadian Large Final Emitter system

There will be no initial allocation in the Canadian LFE system. The crucial and potentially weak point in the Canadian system remains the setting of 2010-BAU

⁴¹⁴ See *supra* p.11.

⁴¹⁵ These were Denmark, Hungary, Ireland, and Lithuania, see online: <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/612&format=HTML&aged=1&language=EN&guiLanguage=en>>.

⁴¹⁶ EC Directive 2003/87, *supra* note 17, Art. 11.4.

⁴¹⁷ Communication of July 2004 regarding national allocation plans, para. 3.4.

⁴¹⁸ Communication on guidance

⁴¹⁹ EC Directive 2003/87, *supra* note 17, Annex III, para.7.

⁴²⁰ RGGI MOU para. 2.G.

⁴²¹ RGGI MOU, para. 2.H; RGGI Model Rule, *supra* note 160, XX-5.3(c).

⁴²² RGGI Model Rule, *supra* note 160, XX-5.3 (c)(2) and (3).

baselines, which may be subject to manipulation by operators of installations and may also act as a disincentive to early action.⁴²³ Subsequent targets (post-2012) will be determined by the government in a cooperative process with provinces and other stakeholders.⁴²⁴ Plant closure and new entrants do not need to be addressed by special provisions in the Canadian system due to its intensity-based approach.⁴²⁵

e) Other examples

In the Norwegian scheme, allocation takes place based on the average emissions in the period 1998 to 2001, with provisions addressing the problems of plant closure⁴²⁶ and new entrants.⁴²⁷ Early Action is not explicitly addressed.⁴²⁸ The CCX uses a very similar baseline model as the Norwegian Scheme.⁴²⁹ The benchmarking model of the NSW GGAS is based on overall demand for electricity and market shares.⁴³⁰ There is no allocation to electricity consumers based on this benchmark.

f) Findings

There seems to be a high degree of awareness of the risks coming with insufficient allocation methodologies. The problems of new entrants and plant closure are addressed by all schemes. No significant problems for linking should therefore arise here. The first experiences with the EU ETS seem to show that member states tended to set their overall trading sector targets on rather lax levels and consequently also over-allocated to many entities. Due to the complexity of allocation rules for individual entities it is difficult to suggest any gateways that might remedy individual over-allocation in case of linking. The problem could only be addressed by maintaining sufficient overall scarcity in each linked scheme, which might be done by auctioning of permits.

⁴²³ Bramley hearing, *supra* note 50, 15.35h.

⁴²⁴ Some standardization in allocation was obviously planned, Canada, Notice of intent, see *supra* note 147, stated in para. 2.1: "In some cases, the targets would be determined by the application of a single formula to different facilities, thereby accounting for factors such as resource-specific operational factors."

⁴²⁵ New entrants are nevertheless addressed by provisions setting standards for them that are based on BATEA (Best available technology economically achievable) standards.

⁴²⁶ Greenhouse Gas Emissions Trading Act, *supra* note 152, at para. 8.c.

⁴²⁷ Greenhouse Gas Emissions Trading Act, *supra* note 152, at para. 8.d.

⁴²⁸ Greenhouse Gas Emissions Trading Act, *supra* note 152, at para. 8 at the end allows for regulations containing "further provisions on the allocation of allowances".

⁴²⁹ See online: <<http://www.chicagoclimateexchange.com/about/program.html>>.

⁴³⁰ See *supra* p. 61.

It has further to be noted, however, that the Canadian intensity-based approach fails to set any binding limits on emissions entities as well as of new entrants. The NSW demand side scheme also inadequately addresses this problem, as overall electricity consumption could grow under the scheme.⁴³¹

IV. Part IV: Compliance and penalty Framework

1. Compliance period, banking and borrowing

The compliance framework for entities participating in an emissions trading scheme is determined by several regulatory choices. The length of the compliance period, i.e. the period for which verified emissions must be covered by emissions allowances or credits must be set, including so-called grace periods, in which entities can bring themselves into compliance. The validity of units beyond a certain compliance period has to be regulated. The option to use units in more than one compliance period is referred to as banking. The opposite option, namely the use units from upcoming compliance periods for compliance in the current period, is referred to as borrowing.

With respect to allowance validity, similar risks as with respect to the updating of allowances arise in the case of linking: A company could have an incentive to reduce or give up activity in a scheme with longer allowance validity, thereby freeing up allowances in that scheme and to restart activity in a scheme that allocates for shorter periods. Keeping in mind that allowance cost is only one relevant element in a large investment decision of this kind, the risk seems to be rather low and easily mitigated by stringent updating provisions.⁴³² Different banking rules would likely lead to a concentration of banking in the scheme with the more flexible banking provisions.⁴³³ Allowances banked in the more flexible system would have to be replaced/reallocated in subsequent commitment periods, if the scheme so requires.⁴³⁴ Problems can arise here, if re-issued allowances have to be backed by international units and consequently, the

⁴³¹ This would lead to an increase in overall generation-related emissions, even if these were under the per-capita benchmark of the scheme. This would not lead to the generation of any tradable credits and thus not necessarily undermine the environmental integrity of a linked scheme.

⁴³² Blyth & Bosi, *supra* note 225, at p. 26.

⁴³³ Blyth & Bosi, *supra* note 225, at p. 27.

⁴³⁴ This is a technical issue – the EU ETS, for example, requires for the reissuing of allowances after the first trading period, see EC Directive 2003/87, *supra* note 17, Art. 13.3.

country issuing a high number of allowances has to convert or free up a high number of AAUs to cover the banked allowances.⁴³⁵

a) Kyoto Protocol

The first compliance period of the Kyoto Protocol runs from 2008-2012, further periods are still in negotiation. A party's compliance obligations are fulfilled by the retirement of AAUs, ERUs, CERs and/or RMUs.⁴³⁶ Inside the first commitment period, banking between years is fully possible. The Kyoto Protocol generally allows for banking of AAUs not required for compliance.⁴³⁷ ERUs and CERs may be transferred to the next commitment period at a scale of 2.5 percent of the parties Assigned amount pursuant to Art 3.7 and 3.8 KP.⁴³⁸ RMUs and ERUs converted from RMUs may not be carried over to a subsequent commitment period.⁴³⁹ tCERs expire at the end of the commitment period following the one they were issued in and are consequently not bankable⁴⁴⁰, ICERs can be reused and de facto banked in case the corresponding reductions are recertified for further crediting periods.⁴⁴¹ Borrowing will occur in cases of non-compliance, leading to a deduction of 1.3 times the amount of missing compliance units from the allocation for the following period.⁴⁴²

b) EU ETS

Compliance in the EU ETS is required on an annual basis.⁴⁴³ The EU ETS so far defines two trading periods, with an option for member states to replace period 1 allowances by new allowances at the beginning of the second trading period. In practice, the scheme will allow for unlimited banking of EU allowances, as it seems in the interest of member states to issue new allowances. CERs and ERUs are bankable to the extent

⁴³⁵ Blyth & Bosi, *supra* note 225, at p.27.

⁴³⁶ See UNFCCC COP Decision 19/CP.7, para.13. "Each Party included in Annex I shall retire ERUs, CERs, AAUs and/or RMUs for the purpose of demonstrating its compliance with its commitment under Article 3, paragraph 1."; tCERs and ICERs are available for compliance due to UNFCCC COP Decision 19/CP.9, Annex A.

⁴³⁷ UNFCCC COP Decision 19/CP.7, Annex I.F (para. 15).

⁴³⁸ UNFCCC COP Decision 19/CP.7, Annex I.F (para. 15).

⁴³⁹ UNFCCC COP Decision 19/CP.7, Annex I.F (para. 15 & 16).

⁴⁴⁰ UNFCCC COP Decision 19/CP.9, Annex A.1.(g) and K.1 (para. 41).

⁴⁴¹ UNFCCC COP Decision 19/CP.9, Annex A.1(h) and K.1, they remain nevertheless bound to the specific crediting period and cannot be used for compliance beyond it.

⁴⁴² Annex to decision 27/CMP.1, para XV.5

⁴⁴³ Blyth & Bosi, *supra* note 225, p. 26, see EC Directive 2003/87, *supra* note 17, Art. 12.3.

that they are valid under the Kyoto Protocol.⁴⁴⁴ The banking status of eventually imported credits from a linked scheme remains unclear to date. It would likely be the same for imported CERs, ERUs, as well as for foreign AAU-backed units. It is not clear for other foreign domestic allowances and offset credits.⁴⁴⁵

c) RGGI

RGGI works with a so-called 'control period' of three years, the first period extending from January 1st, 2009 to December 31st, 2011. In the case of allowance prices exceeding a certain level, the period's length can be extended by one year.⁴⁴⁶ Banking of allowances and offset allowances (which are the only tradable and compliance units under RGGI) is independent from the length of control periods under RGGI and not limited to specific time-periods.⁴⁴⁷ RGGI allows for borrowing of allowances in the case of non-compliance by sources, which leads to a deduction of allowances for a future control period representing three times the amount of uncovered emissions for the control period in question.⁴⁴⁸

d) Canadian Large Final Emitter system

The length of the compliance period in the LFE system should be corresponding to one calendar year.⁴⁴⁹ Banking of credits issued for over-compliance were supposed to be bankable⁴⁵⁰, and the banking of offset credits would also have been possible.⁴⁵¹ Time limitations on banking are nowhere explicitly mentioned, so it shall be assumed that unlimited banking was intended to be possible. However, some limitations would have applied to CDM credits and domestic temporary credits.⁴⁵² For tCERs, there is a rule

⁴⁴⁴ EC Directive 2003/87, *supra* note 17, Art 11a.3.

⁴⁴⁵ The position the EU is going to take on this question will likely depend on the Kyoto units the foreign credits are backed up by – if these are AAUs, no limitation will be imposed, in the case of RMUs, imported units will have to be cancelled at the end of the first Kyoto commitment period.

⁴⁴⁶ RGGI Model Rule, *supra* note 160, XX-1.2 (af); see also Regional Greenhouse Gas Initiative, *Amendment to Memorandum of Understanding* [2006], online: Regional Greenhouse Gas Initiative <http://www.rggi.org/docs/mou_8_8_06.pdf>, at para. 1.

⁴⁴⁷ *Ibid.*, XX-6.6, this also follows from the wide definition of the 'CO₂ allowance' in RGGI Model Rule XX-1.2 (j).

⁴⁴⁸ *Ibid.*, XX-6.5 (d)(1).

⁴⁴⁹ Canada, Instructions Cross-cutting Provisions, *supra* note 146, at para. 3.(1)

⁴⁵⁰ Canada, Notice of intent, see *supra* note 147, at para. 4.1.

⁴⁵¹ Offset System for Greenhouse Gases, Overview Paper, p. 5.

⁴⁵² See the banking limitations imposed by the Kyoto Protocol, *supra* p. 78.

deeming them to have expired on January 1st, 2017⁴⁵³. The duration of ICERs is limited until the date of cancellation or by the determinations of the CDM Executive board, whichever is earlier.⁴⁵⁴ For temporary domestic credits, the same replacement obligation as for tCERs applies.⁴⁵⁵

e) Other examples

The Norwegian scheme works with a compliance period of one year, allowances have to be submitted by May of the following year.⁴⁵⁶ Banking is possible without time constraints.⁴⁵⁷ There are no provisions on the validity periods of imported credits. The CCX allows for banking of CFIs,⁴⁵⁸ but not for borrowing, as all CFIs are vintaged and their use before their vintage year is excluded.⁴⁵⁹ Compliance is assessed on a yearly basis.⁴⁶⁰ Banking of Abatement Certificates is possible under the NSW GGAS.⁴⁶¹

f) Findings

All examined schemes have opted for unlimited banking, only restricted by the Kyoto commitments if applicable to the respective jurisdiction. Borrowing is typically not allowed, although some borrowing may occur inside the penalty regime.⁴⁶² Banking rules should therefore not pose major obstacles to the linking of existing schemes.

2. Complementary compliance mechanisms

This section shall deal with all compliance mechanisms that exist in addition to allowance trading and project-based offset credits, i.e. that do not relate to any emissions-reducing activity. The availability of complementary units is of great importance, as it determines to what extent a trading scheme creates an incentive to produce genuine

⁴⁵³ Canada, Instructions Cross-cutting Provisions, *supra* note 146, para. 8, this corresponds to the limitations set out in UNFCCC COP Decision 19/CP.9, Annex A.

⁴⁵⁴ *Ibid.* para. 9.

⁴⁵⁵ Canada, Instructions Cross-cutting Provisions, *supra* note 146, paras. 5,6.

⁴⁵⁶ Greenhouse Gas Emissions Trading Act, *supra* note 152, at para. 13.

⁴⁵⁷ This follows implicitly from Greenhouse Gas Emissions Trading Act, *supra* note 152, at para. 13, last subparagraph. The period beyond 2007 is not explicitly addressed with respect to banking, but it seems very likely that banking will be possible across periods; the ongoing linking negotiations with the EU support this view.

⁴⁵⁸ See online: <<http://www.chicagoclimateexchange.com/about/program.html>>.

⁴⁵⁹ *Ibid.*

⁴⁶⁰ *Ibid.*

⁴⁶¹ Introduction to GGAS, p.14.

⁴⁶² See *infra* 82.

reductions inside the scheme and thereby also determines the overall environmental performance by linked schemes. Due to the difficulties such mechanisms create for the environmental performance of a scheme and price formation in the market, they will likely have to be abandoned in case of linking. Solely the Canadian proposal would have allowed operators to acquire complimentary units by paying into a Greenhouse Gas Technology Investment Fund⁴⁶³ up to a total amount of 9 Mt CO₂ equivalent.⁴⁶⁴

3. Liability regime

There are two major design options for the liability regime of an emissions trading scheme: buyer liability, meaning that the buyer of emissions units remains responsible for the seller's compliance with its obligations up to the amount of units acquired from it. Seller liability meaning that the seller regardless of any transactions it has made is the only responsible for the fulfillment of its obligations. This has implications in case of linking: If units are sold from a seller liability scheme into a buyer liability scheme, will lead to the buyer being legally required to demonstrate compliance by the seller. The seller entity may therefore get part of its credits back if it is not complying. If units are sold from a buyer liability scheme into a seller liability scheme, the compliance of the buying entity will be assessed on the credits it actually holds. If the seller does not comply with its obligations, there is no way he could demand the credits back from the buyer, unless there are individual contractual arrangements made for this purpose or a linking agreement stipulates so.⁴⁶⁵ A restriction to trading of banked credits has been proposed to avoid difficulties between such schemes.⁴⁶⁶ As the choice of the option of seller liability is common to all reviewed schemes⁴⁶⁷, liability issues should not be a relevant obstacle to linking.

⁴⁶³ The Fund was set up to finance research into less GHG-intensive technologies. Payments into the fund would have lead to this issuance of non-transferable credits.

⁴⁶⁴ This domestic compliance option would not have been linked to any actual GHG reductions in Canada, see Pembina Institute, "Pembina Institute Comments on Environment Canada's *Notice of intent to regulate greenhouse gas emissions by Large Final Emitters*, published in the *Canada Gazette Part I*, July 16, 2005" (2005), online: <http://www.pembina.org/pdf/publications/LFE20050914_Notice_Intent_Reg_LFE.pdf> [Pembina Comments on Notice of Intent], p. 4, 5.

⁴⁶⁵ Otherwise this would amount to an extraterritorial exercise of power, or in case of a private, contractual scheme to a contract to the detriment of a third party. Compare Haites & Mullins, *supra* note 90, at p.60.

⁴⁶⁶ Haites & Mullins, *supra* note 90, at. p. 60.

⁴⁶⁷ Kyoto Protocol, Article 3.10; see critique by Victor, *supra* note 68, at p. 69-73. EC Directive 2003/87, *supra* note17: Art. 4 refers to the necessity of operators holding permits, without mentioning where these

4. Enforcement mechanisms – Penalties

Non-compliance by emitters can trigger various consequences. First, monetary penalties, either set on an absolute level or relating to unit prices, second the obligation to achieve the missing reductions in a subsequent compliance period (borrowing) and finally, other administrative sanctions, such as loss of the operating license.

Combinations of these options are possible. Differing penalty mechanisms can constitute important obstacles to linking, as an ill-designed penalty system can significantly lower the environmental performance of a scheme and consequently also the performance of a linked scheme.

The first option, the imposition pure monetary penalty will act as a price cap on the market, and would allow operators to buy themselves out of their compliance obligations. This concern is particularly relevant if penalties are set lower or not significantly higher than expected permit prices. The price cap effect would also have negative effects on a linked market, as sellers in the price capped system would provide the potential demand from the other scheme with allowances at the cap price or a higher price, depending on demand. Overall environmental performance would thus be diminished and markets would be split as costs of compliance would differ.⁴⁶⁸ If a monetary penalty set higher than actual or estimated credit prices, the price cap effect can be avoided, but such an approach might encounter constitutional problems in certain jurisdictions as for example in Germany.⁴⁶⁹ These price cap effects will also arise in an integrated system of trading schemes.

Second, if a scheme allows for borrowing of allowances from the next compliance period as an alternative for companies paying a monetary penalty, there are further risks. If the penalty is based on actual prices in a specific trading period, there is a possibility to game for very high prices in the next period. If low prices are expected, borrowing will

originate from or whether permits have been sold during the compliance period, see also Art. 12.3 and Artt. 14.3 & 14.4; RGGI Model Rule, *supra* note 160, XX-6.5; Canada, Notice of intent, see *supra* note 147, at para. 4.1; Greenhouse Gas Emissions Trading Act, *supra* note 152, at para. 13 subpara. 1; Electricity Supply Amendment Act 2002, *supra* note 269, § 97BD and 97CC; The Chicago Climate Exchange does not explicitly name its approach, but apparently opts for seller liability as well.

⁴⁶⁸ Blyth & Bosi, *supra* note 225, at p. 30.

⁴⁶⁹ See generally Hillebrand et. al., *supra* note 32, at p. 42; the authors are referring to allocation by auction, but the general principle of equal treatment in law may pose a problem also with respect to penalties; Problems in German law may also arise from the constitutional protection of property rights and the principle of proportionality, compare Wicke, Beyond Kyoto, *supra* note 73, at p. 270-271.

occur and thus ultimately compliance should occur. If high prices are anticipated, operators will tend to pay the penalty and avoid compliance.⁴⁷⁰

Third, penalties can also include the loss of the authorization to participate in emissions trading or of the operating license for emitting facilities.⁴⁷¹

The fourth option, which is a combination of a monetary penalty with the obligation to achieve the missing reductions additionally to the reductions obligations in the subsequent trading period, seems to be able to avoid the price cap effect, and thus preferable in terms of environmental performance.⁴⁷² It may, however, place a higher economic burden on operators.

a) Kyoto Protocol

The Kyoto Protocol Enforcement mechanism works by allowing for borrowing and attempting to re-establish compliance while excluding the non-complying party from international allowance transfers.⁴⁷³ Non-compliance of a Kyoto party can thus trigger non-eligibility of entities that are its nationals to participate in international entity-level emissions trading.⁴⁷⁴ The Protocol, however, does not contain rules on penalties for entities participating in emissions trading.

b) EU ETS

In the EU ETS the levels of penalties centrally set at €40 per excess ton of CO₂ emissions for the period 2005-2007 and at €100 for the period 2008-2012⁴⁷⁵, enforcement takes place via the administrative law of each member state. Enforcement is rather likely, as member states are subjected to judicial control by the E.C.J. with respect to penalty setting and enforcement. Obligations not fulfilled in a particular compliance year are carried forward to the next compliance period.⁴⁷⁶

⁴⁷⁰ See generally Blyth & Bosi, *supra* note 225, at p. 29.

⁴⁷¹ Blyth & Bosi, *supra* note 225, at p. 29.

⁴⁷² Blyth & Bosi, *supra* note 225, p.29 compare it to a tax on borrowing.

⁴⁷³ Annex to decision 27/CMP.1, para XV.5

⁴⁷⁴ See *supra* p. 18.

⁴⁷⁵ EC Directive 2003/87, *supra* note 17, Artt. 16.3 and 16.4.

⁴⁷⁶ *Ibid.* Artt 16.3 and 16.4.

c) RGGI

The entity level penalty in case of non-compliance is the deduction of allowances for future compliance periods. The penalty amounts to three times the excess emissions.⁴⁷⁷ In addition to this, there will administrative fines, penalties or other remedies under the laws of the respective signatory states – there are no common standards agreed for the level of these fines, but merely procedural rules⁴⁷⁸ No CO2 offset allowances may be deducted to make up for the excess emissions of a source.⁴⁷⁹ As increased compliance is required in the following control period, incentives for shifting non-compliance between different RGGI states are very low, even if fines should differ substantially. But the RGGI penalty level seems so high that compliance-shifting from another scheme may be attractive, if RGGI should opt for full-scale linking at some point.

d) Canadian Large Final Emitter system

The Canadian approach is to have penalties per excess ton of up to CAN\$200. It seemed that higher reductions for the next period will not be required if a penalty is paid.

e) Other examples

The Norwegian system sets the fine per ton of excess emissions at €40 per ton for the first trading period.⁴⁸⁰ Foregone emissions reductions have to be covered by allowances from the subsequent trading year.⁴⁸¹ The Chicago Climate Exchange claims to have a penalty regime, but details on it are not readily available.⁴⁸² Compliance shortfalls may be carried forward for one year under the NSW GGAS⁴⁸³, before a penalty of AUS\$ 10.50 per ton⁴⁸⁴ becomes due.

⁴⁷⁷ RGGI Model Rule, *supra* note 160, XX-6.5 (d)(1).

⁴⁷⁸ *Ibid*, XX-6.5 (d)(2).

⁴⁷⁹ *Ibid*, XX-6.5 (d)(1)

⁴⁸⁰ Greenhouse Gas Emissions Trading Act, *supra* note 152, at para. 21.

⁴⁸¹ Greenhouse Gas Emissions Trading Act, *supra* note 152, at para. 13, second subparagraph.

⁴⁸² See reference to penalties in press statement from March 6, 2005, online: <http://www.chicagoclimatex.com/news/articles/archive/newsScroller2005061507522769.html>, this reluctance to publish details may be due to business confidentiality concerns of participants.

⁴⁸³ Electricity Supply Amendment Act 2002, *supra* note 269, § 97 BE.

⁴⁸⁴ Electricity Supply Amendment Act 2002, *supra* note 269, § 97CA.

f) Findings

The majority of the examined schemes have opted for a combination of ongoing obligations for non-complying emitters in combination with a penalty or for a very high penalty level.⁴⁸⁵ The risk of compliance shifting therefore does not appear as a major risk for linking any of these schemes.

5. Price-triggered safety valves

One major concern in the debate on the Kyoto commitments was that the commitments could lead to unpredictable economic distortions if prices of units exceeded a certain level.⁴⁸⁶ Emission levels were by some deemed to be politically uncontrollable and consequently quantitative commitments had to be problematic.⁴⁸⁷ These concerns have also figured prominently among the arguments brought forward against ratifying the Protocol by the US and Australian governments.⁴⁸⁸ The remedy suggested for this shortcoming of the Protocol was the creation of price-triggered economic safety valves, i.e. allowing for non-compliance with targets against payment of a fine or tax on the excess emissions or for the issuance of additional allowances⁴⁸⁹ if prices surpassed a certain level. The economic concerns discussed for the Kyoto Protocol apply to entity level trading as well.⁴⁹⁰ On the domestic level, a further proposal is to reimburse emitters for higher costs they had to incur to reduce emissions or buy units. Another approach to build in a safety valve is allowing access to units previously blocked from the scheme, thereby increasing the overall supply of units and lowering compliance cost.⁴⁹¹ There

⁴⁸⁵ As it is the case in the Canadian example.

⁴⁸⁶ Victor, *supra* note 68, p. 26.

⁴⁸⁷ *Ibid*, p.11.

⁴⁸⁸ *Ibid*, p.11, 26.

⁴⁸⁹ Such allowances could be defined as non-tradable to avoid a credit inflation, see Blyth & Bosi, *supra* note, see Blyth & Bosi, *supra* note 225, p. 29, note 20.

⁴⁹⁰ See generally Hillebrand et al., *supra* note 32, p. 52; Schwerd, Joachim, "Das "safety valve"-Konzept im Klimaschutz – Idee und Kritik", (2005) Zeitschrift für Umweltpolitik und Umweltrecht 321, english summary at 344.

⁴⁹¹ But see also Haites & Mullins, *supra* note 90, at p. 63, where they point out that such credits would probably already have been replaced by credits of other schemes that are eligible for compliance, so that this would not change the supply of units substantially; Compare EC Extended Impact Assessment, *supra* note 290, at p. 21.

have also been suggestions that a price cap could be avoided by relying on trading in future options on emissions rights.⁴⁹²

One advantage of price caps is that they generate government revenue that can, if desired, be used to achieve emissions reductions in non-trading sectors of the economy or in international projects.⁴⁹³ On the other hand they lower the pressure in the main emitting sectors to achieve reductions through investment-intensive technological change.⁴⁹⁴

If it comes to linking between different systems, the major desired function of a safety valve becomes particularly important: It acts as a price cap. If it is set high above likely unit prices, the cap will remain untriggered and thus rather irrelevant. If, however, the price cap in one system is in the range of potential credit prices and gets triggered, it increases the number of allowances in the overall system (if new allowances are issued) or lowers the demand for allowances from the system in which the price cap operates (in case of tax payments or reimbursement of emitters). A triggered cap in one system will thus result in lower environmental performance in both schemes as opposed to only affecting it in one scheme. Only if safety valves existed in both schemes and had a harmonized trigger price, the environmental and economic result would not be different after linking.

The Kyoto Protocol does not set any price of units that would allow for an inflation of a country's assigned amount.

The EU ETS does not contain any safety valve except for a provision for cases of force majeure which allows for additional allocation of non-transferable units by member states on approval of the European Commission.⁴⁹⁵

The only safety valve mechanisms under RGGI is the already described mechanism that allows for the use of a higher percentage of offset credits at a first trigger price and

⁴⁹² Schwerd, Joachim, "Das "safety valve"-Konzept im Klimaschutz – Idee und Kritik", (2005) Zeitschrift für Umweltpolitik und Umweltrecht 321, english summary at 344.

⁴⁹³ Müller et al, *supra* note 380, at p.36 ; Compare also Ekins & Barker, *supra* note 36, at p. 89 on revenue-recycling for other policy objectives, such as lowering personal income taxes or Social Security taxes.

⁴⁹⁴ See *supra* p. 9.

⁴⁹⁵ EC Directive 2003/87, *supra* note 17, Art. 29; The European Commission clarifies this Article in a Communication, the surpassing of certain price levels does not figure among the cases of force majeure there: see *supra* note 410.

for the use of international credits at a second, higher trigger price.⁴⁹⁶ This approach is not a classical safety valve, as it does not determine a cap on the allowance price, although prices would likely drop with new allowances becoming available in the scheme. As long as these external allowances are linked to credible domestic or international emissions offsets, this does not raise any of the environmental concerns described before.

The Canadian regulator had envisaged a ‘price assurance’ at a level of CAN\$15 per ton of CO₂ emissions. It had not been fixed at the latest stage of development, how this assurance was to be implemented. All three options for implementing a safety valve had been discussed: issuance of additional credits, payment into a fund or rebates on verified cost.⁴⁹⁷

The Norwegian scheme has not adopted any safety valve rules. No information is available as to the approach of the CCX to safety valves. The NSW GGAS seems to operate without such a mechanism as well.

Safety valves do not figure prominently among the design choices of regulators. Problems of linking could particularly arise from linkages with the Canadian scheme, especially considering its rather low price cap.⁴⁹⁸

6. Legal gateways addressing different compliance and penalty regimes

Finally, different penalty regimes may be addressed by legal gateways or harmonization as well. Establishing a gateway without compromising environmental integrity and economic efficiency of a scheme seems difficult in case that the penalty in one scheme is lower than the unit price in the combined scheme. The only instrument which seems available here is levying a tax removing the profits from the unit sale so that the maximum unit price is equal to the penalty in the scheme with the lower penalty. Such a tax could be levied by either of the scheme regulators. Harmonization of the penalty levels is certainly the preferable action here, as it avoids the administrative cost

⁴⁹⁶ See *supra* page 57.

⁴⁹⁷ Canada, Notice of intent, see *supra* note 147, at para.3.3.

⁴⁹⁸ Which has to be seen in relation to EU prices that have for some time been above the €30 mark and are now floating around €16, i.e. constantly visibly above what in Canada was envisaged as a safety valve price. As Canada is potentially a country facing abatement costs comparable to those of the EC, the cap would probably be triggered very frequently, if not permanently.

coming with a tax. As already stated, penalty levels will have to be sufficiently high with respect to prices to avoid a price-cap effect.⁴⁹⁹

Ultimately, harmonization of penalty levels seems the only way to address this concern, unless penalty levels are set significantly above expected permit prices. But even in that case there remains an incentive to shift non-compliance to the scheme with the lower penalty if the difference between the penalties exceeds the unit price in the linked scheme. If compliance obligations corresponding to the shortfall are carried forward to the next compliance period in both schemes, very likely no gateway construction is required, as the incentive for non-compliance is much lower and will, apart from very extreme price levels, not exist at all.

If one scheme works with a safety valve approach and the trigger price is likely to be surpassed, there would always be some price distortion and compliance shifting in the market. So, with respect to environmental effectiveness and economic efficiency, linking into a scheme with a safety valve is not to be recommended.

C. Conclusion

The examination in this paper has shown that the legal framework in which emissions trading schemes are rooted is of fundamental importance for the success of linking.

Further, three design choices have been identified as very important for linking efforts. These are the presence of an absolute cap on emissions in all linked schemes, different rules of credit generation and recognition and the penalty regime. In these fields, proper harmonization of design or the establishment of gateways is required in order to create links that do not undermine the environmental objective of emissions trading.

In practice we have seen that there is a preference of regulators for *cap-and-trade* schemes focusing on direct emissions by large emitters. This is likely to constitute the major trading scheme model for the future, unless a different global approach to emissions reductions is adopted.⁵⁰⁰ Intensity-based schemes, as opposed to this, will tend to undermine environmental effectiveness in a global trading system and are not very promising candidates for participation in linking.

⁴⁹⁹ See *supra* p. 82.

⁵⁰⁰ Compare Woerdman, *supra* note 43, at pp. 368-371 who describes the model of institutional lock-in of certain policy choices.

During the first commitment period of the Kyoto Protocol, linking of schemes will most likely stay confined to Europe, where the EU ETS is going to establish links with neighboring smaller schemes. The size relations between the EU ETS and, for example the Norwegian scheme, indicate that there will be a strong tendency for schemes to be harmonized towards the EU ETS design.⁵⁰¹ Other transaction between schemes, as the import of units into the Chicago Climate Exchange or into RGGI will presumably remain isolated events.

It has nevertheless to be underlined here that in particular the EU ETS and RGGI do not have substantial design differences. This means that linking between them would likely be economically beneficial and not detrimental to environmental effectiveness of the schemes. Linking would be easy from a technical perspective. The obstacles are rather rooted in US constitutional law and different international commitments of the EU and the US. A higher degree of political flexibility by the US would therefore be desirable, as well as a more flexible international approach with respect to the inclusion of mandatory capped reductions programs in the global efforts to reduce GHG emissions. The efforts on the US West coast to establish a GHG caps and a regional emissions trading market will face the same challenges, but also increase pressure on the US government to allow for some interlinking of these schemes with schemes in other countries.

⁵⁰¹ See criticism on the design changes on the Norwegian scheme from upstream to downstream trading by Kristin Rypdal, Kristin "Emissions trading: From comprehensive to EU adapted" (21 September 2004), online: Center for International Climate and Environmental Research Oslo (CICERO) <<http://www.cicero.uio.no/fulltext.asp?id=2995&lang=no>>.

D. BIBLIOGRAPHY

LEGISLATION

INTERNATIONAL AGREEMENTS

Cartagena Protocol on Biosafety to the Convention on Biological Diversity, 29 January 2000, 39 I.L.M. 1027,

online: Biodiversity Convention Secretariat

<<http://www.biodiv.org/doc/legal/cartagena-protocol-en.pdf>>.

Convention on Biological Diversity, 5 June 1992, 1760 U.N.T.S. 79.

online: Biodiversity Convention Secretariat

<<http://www.biodiv.org/convention/convention.shtml>>.

General Agreement on Tariffs and Trade (1994), 15 April 1994, 1867 U.N.T.S. 187,

online: WTO <http://www.wto.org/English/docs_e/legal_e/06-gatt.pdf>.

General Agreement on Tariffs and Trade (1947), 30 October 1947, 55 U.N.T.S. 194,

online: WTO <http://www.wto.org/English/docs_e/legal_e/gatt47_e.pdf>.

Kyoto Protocol to the United Nations Framework Convention on Climate Change,

(UNFCCC COP Decision 1/CP.3.), 11 December 1997, 37 I.L.M. 22,

online: UNFCCC <<http://unfccc.int/resource/docs/convkp/kpeng.pdf>>.

Montreal Protocol on Substances that Deplete the Ozone Layer, 16 September 1987,

1522 U.N.T.S. 3, 26 I.L.M. 1541 (entered into force 1 January 1989)

online: UNEP <<http://ozone.unep.org/pdfs/Montreal-Protocol2000.pdf>>.

United Nations Framework Convention on Climate Change, 9 May 1992, 1771 U.N.T.S., 165,

online: UNFCCC <<http://unfccc.int/resource/docs/convkp/conveng.pdf>>.

Vienna Convention for the Protection of the Ozone Layer, 22 March 1985, 26 I.L.M. 1529,

online: UNEP <<http://www.unep.ch/Ozone/pdfs/viennaconvention2002.pdf>>.

Vienna Convention on the Law of treaties, 23 May 1969, 1155 U.N.T.S. 331; 8 I.L.M. 679 (1969),

online: UN

<http://untreaty.un.org/ilc/texts/instruments/english/conventions/1_1_1969.pdf>.

CANADA

Canadian Environmental Protection Act, S.C. 1999, c. 33.

Canada Emission Reduction Incentives Agency Act (2005) c.30 s.87.

EUROPEAN UNION

EC, *Commission Regulation (EC) No 2216/2004 of 21 December 2004 for a standardized and secured system of registries pursuant to Directive 2003/87/EC of the European Parliament and of the Council and Decision No 280/2004/EC of the European Parliament and of the Council (text with EEA relevance) [2004] O.J. L. 386/1.*

EC, Commission, *Commission Decision of 29 January 2004 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council [2004], O.J. L. 59/1.*

EC, *Council Decision of 25 April 2002 concerning the approval, on behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the joint fulfilment of commitments thereunder [2002] O.J. L. 130/1.*

EC, *Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control [1996] O.J. L. 257/26.*

EC, *Council Decision of 24 June 1993 for a monitoring mechanism of Community CO₂ and other greenhouse gas emissions, [1993] O.J. L. 167/31.*

EC, *Decision No 280/2004/EC of the European Parliament and of the Council of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol, [2004] O.J. L. 49/1.*

EC, *Directive 2003/87/EC of the European Parliament of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (text with EEA relevance) [2003] O.J. L. 275/32.*

EC, *Directive 2004/101/EC of the European Parliament and of the council of 27 October 2004 amending directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the community, in respect of the Kyoto Protocol's project mechanisms (text with EEA relevance) [2004] O.J. L. 338/18.*

NEW SOUTH WALES

Electricity Supply Amendment (Greenhouse Gas Emission Reduction) Act 2002 (N.S.W.),
Online: New South Wales
<[http://www.legislation.nsw.gov.au/sessionalview/sessional/TITLE/Electricity%20Supply%20Amendment%20\(Greenhouse%20Gas%20Emission%20Reduction\)%20Act%202002%20No%20122.pdf](http://www.legislation.nsw.gov.au/sessionalview/sessional/TITLE/Electricity%20Supply%20Amendment%20(Greenhouse%20Gas%20Emission%20Reduction)%20Act%202002%20No%20122.pdf)>.

NORWAY

Act relating to greenhouse gas emission allowance trading and the duty to surrender emission allowances, Act No.99 (2004),
online: <<http://www.e-norway.no/md/english/doc/legislation/acts/022051-200015/dok-bn.html>>.

UNITED STATES

The Clean Air Act, 42 U.S.C. s/s 7401 et seq. (1970).

The Clean Water Act, 33 U.S.C. ss/1251 et seq. (1977).

The Endangered Species Act, 7 U.S.C. 136;16 U.S.C. 460 et seq. (1973).

Federal Insecticide, Fungicide and Rodenticide Act, 7 U.S.C. s/s 135 et seq. (1972).

JURISPRUDENCE

CANADA

Attorney-General of Ontario v. Orange Productions Ltd., [1971] 3 O.R. 585, 21 D.L.R. (3d) 257 (H.C.J.).

Attorney-General of Ontario v. Canadian Wholesale Grocers Assn. (1922), 52 O.L.R. 536 (H.C.); affd. (1923), 53 O.L.R. 627 (C.A.).

EUROPEAN UNION

E.C.J., *Legal Opinion 1/94*, [1994] E.C.R. I-5267.

GATT DISPUTE SETTLEMENT

United States – Restrictions on imports of Tuna (complaint by EEC) (1994), GATT Doc. DS29/R, unadopted, 33 I.L.M 839,
online: Internet Guide to International Fisheries Law
<<http://www.intfish.net/cases/other/gatt1994/report.pdf>>.

INTERNATIONAL ARBITRATION

Spain v. France (1957), 24 I.L.R. 101.

United States v. Canada (1938), 3 R. Int'l Arb. Awards 1911, (reprinted in 33 A.J.I.L. 182).

United States v. Canada (1941), 3 R. Int'l Arb. Awards 1938, (reprinted in 35 A.J.I.L. 684).

UNITED KINGDOM

Attorney-General v. P.Y.A. Quarries Ltd., [1957] 2 Q.B. 169, [1957] 1 All E.R. 894, at 908 per Denning L.J. (C.A.).

St Helens Smelting Co v Tipping (1865) 11 H.L.Cas. 642.

Andreae v. Selfridge & Co Ltd [1938] Ch 1; [1937] 3 All E.R. 255.

UNITED STATES

Board of Regents of State Colleges v. Roth, 408 U.S. 564, 92 S.Ct. 2701 (1972).

State of Missouri v. Holland, I. 252 U.S. 416 (1920).

Willson v. Black Bird Creek Marsh Co., 27 U.S. 245 (1829).

WTO DISPUTE SETTLEMENT

European Communities - Measures Affecting Asbestos and Asbestos-Containing Products (Complaint by Canada) (2001), WTO Doc. WT/DS135/AB/R at para. 101 (Appellate Body Report),
online: WTO <<http://docsonline.wto.org/DDFDocuments/t/WT/DS/135ABR.doc>>.

United States – Import prohibition of certain Shrimp and Shrimp products (complaint by, India, Malaysia, Pakistan and Thailand) (1998), WTO Doc. WT/DS58/AB/R at para 38 (Appellate Body Report),
online: WTO <http://www.wto.org/english/tratop_e/dispu_e/58abr.pdf>.

SECONDARY SOURCES: MONOGRAPHS

Backhaus, Jürgen G., *The Elgar Companion to Law and Economics* (2nd Ed.), (Cheltenham UK, Northampton, MA: Edward Elgar Publishing Ltd., 2005).

Butler, Henri N. & Drahozal, Christopher R., *Economic Analysis for Lawyers* (2nd Ed.) (Durham, NC: Carolina Academic Press, 2006).

Cramton, Peter & Kerr, Suzy, *Tradable permit auctions: how and why to auction not grandfather*, Resources for The Future Discussion Paper 98-34 (Washington DC: Resources for the Future, 1998)
online: Resources for the Future Foundation <<http://www.rff.org/rff/Documents/RFF-DP-98-34.pdf>>.

Dales, J.H., *Pollution, Property & Prices* (Toronto, University of Toronto Press, 1968).

Driesen, David M., *The Economic Dynamics of Environmental Law* (Cambridge, MA: MIT Press, 2003).

Freestone, David & Charlotte Streck, eds., *Legal Aspects of Implementing the Kyoto Protocol Mechanisms – Making Kyoto Work* (Oxford: Oxford University Press, 2005)

Hanley, Nick & Roberts, Colin J., eds., *Issues in Environmental Economics* (Oxford, Blackwell Publishers, 2002).

Hillebrand, Bernhard et.al., *CO₂ Emissions Trading Put to Test* (Münster, Lit Verlag, 2002).

Hogg, Peter W. *Constitutional Law of Canada* (2nd Ed.) (Scarborough, Ont.: Thomson Carswell, 2005).

International Emissions Trading Association, *Greenhouse Gas Market 2005 – The rubber hits the road* (Geneva: IETA, 2005)
online: IETA <<http://www.ieta.org/ieta/www/pages/getfile.php?docID=1742>>.

International Emissions Trading Association, *Greenhouse Gas Market 2004 – ready for take-off* (Geneva: IETA, 2004)
online: IETA <<http://www.ieta.org/ieta/www/pages/getfile.php?docID=720>>.

International Emissions Trading Association, *Greenhouse Gas Market 2003 – emerging but fragmented* (Geneva: IETA, 2003)
online: IETA <<http://www.ieta.org/ieta/www/pages/getfile.php?docID=169>>.

International Energy Agency, *Beyond Kyoto – Energy Dynamics and Climate Stabilisation* (Paris: OECD/IEA, 2002).
online: IEA <http://www.iea.org/textbase/envissu/cop9/files/beyond_kyoto.pdf>.

IPCC, *Carbon Dioxide Capture and Storage – Summary for Policymakers and Technical Summary* (2005)
online: <http://arch.rivm.nl/env/int/ipcc/pages_media/SRCCS-final/ccsspm.pdf>.

IPCC, *Safeguarding the Ozone Layer and the Global Climate System - Issues Related to Hydrofluorocarbons and Perfluorocarbons - Summary for Policymakers and Technical Summary* (2005)
online: <http://arch.rivm.nl/env/int/ipcc/pages_media/SROC-final/srocspts_en.pdf>.

IPCC, *Climate Change 2001: Synthesis Report. A Contribution of Working Groups I, II and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2001). [Watson R.T. et al., eds.]

IPCC, *Climate Change 2001: The Scientific Basis (Working Group I)*, (Cambridge: Cambridge University Press, 2001).

IPCC, *Climate Change 2001: Impacts, Adaptation and Vulnerability (Working Group II)*, (Cambridge: Cambridge University Press, 2001).

IPCC, *Climate Change 2001: Mitigation (Working Group III)*, (Cambridge: Cambridge University Press, 2001).

IPCC, press release, “Preparations for Fourth Assessment Report still under way” \ (Geneva: IPCC, 2 May 2006).
Online: <<http://www.ipcc.ch/press/pr02052006.htm>>.

Ippolito, Richard A., *Economics for Lawyers* (Princeton: Princeton University Press, 2005).

Kaul, Inge, et. al. (eds.), *Global Public Goods – International Cooperation in the 21st Century* (New York: Oxford University Press, 1999).

Kommers, Donald R., *The Constitutional Jurisprudence of the Federal Republic of Germany* (Durham: Duke University Press, 1997).

Lecocq, Franck, *State and Trends of the Carbon Market – 2004*, (Washington D.C., The World Bank, 2005).

- LIFE Emissions Trading Scheme, “LETS Update: Scoping Phase Report” (2006)
 Online: Ends Europe Daily <<http://www.endseuropedaily.com/docs/60509b.pdf>>.
- Michaels, Patrick J. (Ed.), *Shattered Consensus – The True State of Global Warming* (Lanham: Rowman & Littlefield Publishers, 2005).
- Michaels, Patrick J. & Robert C. Balling Jr., *The Satanic Gases – Clearing the Air about Global Warming* (Washington D.C.: Cato Institute, 2000).
- Nowak, John E. & Ronald D. Rotunda, *Constitutional Law*, 2nd Ed., (St. Paul: Thomson West 2005).
- O’Brien, John, *International Law* (London: Cavendish Publishing Limited, 2001).
- Oberthür, Sebastian & Ott, Hermann E., *The Kyoto Protocol – International Climate Policy for the 21st Century* (Berlin, Heidelberg: Springer, 1999).
- Pigou, Arthur Cecil, *The Economics of Welfare* (4th Ed.) (London: Macmillan and Co.,Ltd., 1932 (reprint 1948)).
- Victor, David G., *The Collapse of the Kyoto Protocol and the struggle to slow global warming* (Princeton: Princeton University Press, 2001).
- Wicke, Lutz, *Beyond Kyoto - A New Global Climate Certificate System* (Heidelberg: Springer 2005).
- Wold, Chris & Gaines, Sanford & Block, Greg, *Trade and the Environment – Law and Policy* (Durham, NC: Carolina Academic Press, 2005).

SECONDARY SOURCES: ARTICLES AND OTHER SOURCES

- 37th Parliament (3rd Session), Standing Committee on Environment and Sustainable Development, *Evidence, Contents* (March 24, 2004),
 online:
 <<http://www.parl.gc.ca/committee/CommitteePublication.aspx?SourceId=76346>>.
- 37th Parliament (3rd Session), Standing Committee on the Environment and Sustainable Development. 2005. *Finding the Energy to Act: Reducing Canada’s Greenhouse Gas Emissions*, p.44;
 online:
 <<http://www.parl.gc.ca/infocomdoc/38/1/parlbus/commbus/house/ENVI/report/RP1875334/envirp07/envirp07-e.pdf>>.
- Baron, Richard & Bygrave, Stephen, “Towards International Emissions Trading: Design

Implications for linkages” (Paris: OECD/IEA Information Paper, 2002)
Online: <<http://www.oecd.org/oecd/pages/home/displaygeneral/0,3380,EN-document-517-nodirectorate-no-21-32543-8,00.html>>.

Baumol, William J., “On taxation and the control of externalities (1972) 62 Am. Econ. Rev. 307.

Baumol, William J. & Oates, Wallace E., “The use of standards and prices for the protection of the environment” (1971) 73, Swedish J. of Econ. 42.

Bloomberg News, „EU trading of pollution credits fails on goals“ (24 July 2006),
online: Bloomberg News
<<http://www.iht.com/articles/2006/07/24/business/carbon.php>>.

Blyth, William & Bosi, Martina, “Linking Non-EU Domestic Trading Schemes with the EU Emissions Trading Scheme” (Paris: OECD/IEA, 2004),
online: OECD <<http://www.oecd.org/dataoecd/38/7/32181382.pdf>>.

Bygrave, Stephen & Bosi, Martina, “Linking Project-Based Mechanisms with Domestic Greenhouse Gas Emissions Trading Schemes” (Paris: OECD/IEA, 2004)
online: OECD <<http://www.oecd.org/dataoecd/38/8/32181359.pdf>>.

Canada, *A discussion paper on Canada’s Contribution to addressing Climate Change*, (Ottawa: Government of Canada, 2002) at 10, online:
<www.climatechange.gc.ca/english/publications/canadascontribution/Report051402/englishbook.pdf>.

Canada, Environment Canada, *Drafting Instructions Cross-Cutting Provisions Large Final Emitters Regulations* (November 2005),
Online:
<http://www.ec.gc.ca/CEPARRegistry/documents/part/LFE_drft_inst/Crosscutting_for_public_comment.pdf>.

Canada, Environment Canada, *Offset system for Greenhouse Gases – Technical Background Document*, (Ottawa, Environment Canada, 2005).
online: <http://www.climatechange.gc.ca/english/publications/offset_gg/tech_e.pdf>.

Canada, Minister of the Environment Rona Ambrose, Speech “A Breath of Fresh Air: Made in Canada Solutions to Meet Canada's Environmental Challenges” (31 March 2006),
online: Environment Canada
<http://www.ec.gc.ca/minister/speeches/2006/060331_s_e.htm>.

Canada, Minister of the Environment Rona Ambrose, speech “Announcement Concerning Canada’s Clean Air Act” (19 October 2006),

online: Environment Canada
<http://www.ec.gc.ca/minister/speeches/2006/061019_s_e.htm>.

Canada, Government of Canada, *Climate Change Plan for Canada* (Ottawa, Government of Canada, 2002),
online:
<http://climatechange.gc.ca/english/publications/plan_for_canada/plan/pdf/full_version.pdf>.

Canada, Government of Canada, *Moving Forward on Climate change – a plan for honouring our Kyoto Commitment*, (Ottawa, Government of Canada, 2005),
online: <http://climatechange.gc.ca/kyoto_commitments/report_e.pdf>.

Carbonpositive, CER Market Report, "CER prices follow EU market down" (12 October 2006),
online: carbonpositive
<<http://www.carbonpositive.net/viewarticle.aspx?articleID=137>>.

Carmody, Josh & Willis, Monique, "Emissions Trading Schemes in Australia", Freestone & Streck, *supra* note 5, p. 479.

Coase, Ronald H., The problem of social cost, 3. J.L. & Econ. 1 (1960).

Cole, Daniel H., "From Local to Global Property: Privatizing the global environment?: Clearing the Air: Four Propositions About Property Rights And Environmental Protection" (1999) 10 *Duke Env'tl L. & Pol'y F.*, 103.

Demsetz, Harold, 'Toward a theory of property rights', (1967) *American Economic Review* 57, 347-359.

Dodwell, Chris, "UK Emissions Trading Schemes", in: Freestone & Streck, *supra* note 5, p. 445.

Doelle, Meinhard, "Critical Notice: The Kyoto Protocol: Reflections on its Significance on Occasion of its Entry into Force" (2004) 27, *Dalhousie L. J.* 555.

Driesen, David M., "Free Lunch or cheap fix? The Emissions Trading Idea and the Climate Change Convention", (1998) 26 *B.C. Env'tl. Aff. L. Rev.* 1.

Driesen, David M., "Is Emissions Trading an Economic Incentive Program? Replacing the Command and Control/Economic Incentive Dichotomy", (1998) 55 *Wash & Lee L. Rev.* 289.

David G. Duff, "Tax Policy and Global Warming", (2003) *Public Law and Legal Theory Research Paper No. 03-03*, *Law and Economics Research Paper No. 03-04*,

online: <<http://papers.ssrn.com/abstract=428320>>.at p. 70,71.

Ellis, Jane & Karousakis, Katia, “The Developing CDM Market – May 2006 Update” (Paris: OECD/IEA, 2006),
online: OECD <<http://www.oecd.org/dataoecd/33/30/36835979.pdf>>.

EC, Commission, press release, “High Level Group proposes urgent actions to promote a competitive and sustainable European energy system” (Brussels: EC, 2 June 2006)
online: <<http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/06/729>>.

EC, Commission, press release “EU emissions trading scheme delivers first verified emissions data for installations” (Brussels: EC, 15 May 2006)
online: <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/612>>.

EC, Commission, press release „EU climate change policies: Commission asks member states to fulfil their obligations” (Brussels: EC, 6 April 2006)
online: <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/469>>.

EC, Commission, press release “Emissions Trading: Commission sets out guidance on national allocations for 2008-2012” (Brussels, EC, 9 January 2006)
online:
<<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/9&format=H>>.

EC, Commission, *Environment fact sheet: energy for sustainable development*, (Brussels: EC, 2006),
online: EC <http://ec.europa.eu/environment/climat/pdf/energy_fact_sheet.pdf>.

EC, Commission, *Communication ‘Further guidance on allocation plans for the 2008 to 2012 trading period of the EU Emissions Trading Scheme’*, COM(2005) 703 final [2005],
online: <http://ec.europa.eu/environment/climat/pdf/nap_2_guidance_en.pdf>.

EC, Commission, *Communication from the Commission to the Council, the European Parliament, the European Economic and Social committee and the Committee of the Regions – Winning the Battle Against Global Climate Change*, SEC(2005) 180 [2005],
online: <http://ec.europa.eu/environment/climat/pdf/comm_en_050209.pdf>.

EC, Commission, *Communication From The Commission To The Council And To The European Parliament on Commission Decisions of 7 July 2004 concerning national allocation plans for the allocation of greenhouse gas emission allowances of Austria, Denmark, Germany, Ireland, the Netherlands, Slovenia, Sweden, and the United Kingdom in accordance with Directive 2003/87/EC* [2004] (not published in the Official Journal),
online: EC <http://europa.eu.int/eur-lex/en/com/cnc/2004/com2004_0500en01.pdf>.

- EC, Commission, *Communication on guidance to assist Member States in the implementation of the criteria listed in Annex III to Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC and on the circumstances under which force majeure is demonstrated*, COM(2003) 830 final [2003] (not published in the Official Journal),
online: EC <http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type_doc=COMfinal&an_doc=2003&nu_doc=830>.
- EC, Commission, *Commission Staff Working Paper – Extended Impact Assessment on the Directive of the European Parliament and the Council amending Directive establishing a scheme for greenhouse gas emissions allowance trading within the Community, in respect of the Kyoto Protocol’s project based mechanisms*, COM(2003)403 final,
online:
<http://ec.europa.eu/governance/impact/docs/ia_2003/sec_2003_0785_en.pdf>.
- EC, Commission, presentation *Linking project credits to the EU emissions trading scheme - COM(2003)403*,
online: <<http://ec.europa.eu/environment/climat/pdf/linkingprojectcredits.pdf>>.
- EC, Commission, *Green Paper on greenhouse gas emissions trading within the European Union*, COM(2000) 87,
online: EC <http://eur-lex.europa.eu/LexUriServ/site/en/com/2000/com2000_0087en01.pdf>.
- EC, Parliament, *Position of the European Parliament adopted at first reading on 20 April 2004 with a view to the adoption of Directive 2004/.../EC of the European Parliament and of the Council amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol’s project mechanisms* [2004] O.J. C. 104E/347.
online: <<http://eur-lex.europa.eu/LexUriServ/site/en/oj/2004/ce104/ce10420040430en03470354.pdf>>.
- Evans, Brian, “Principles of Kyoto and Emissions Trading Systems: A Primer for Energy Lawyers” (2004) 42 Alberta L. Rev. 167.
- Euractiv „German steel industry calls for halt to EU emissions trading” (26 January 2006),
online: <<http://www.euractiv.com/Article?tcmuri=tcm:29-151957-16&type=News>>.
- European Climate Change Program Working Group on JI/CDM, “Conclusions” (15 November 2002),
online:
<http://europa.eu.int/comm/environment/climat/jicdm/jicdm_final_conclusions.pdf>.

- Figueres, Christiana, “Sectoral CDM: Opening the CDM to the Yet Unrealized Goal of Sustainable Development”, (2006) JSDLP 2:1, p. 5-25.
- Fischer, Carolyn, “Combining rate-based and cap-and-trade emissions policies”, (2002) Climate Policy 3S2, 89.
- Freestone, David “ The UN Framework Convention on Climate Change, the Kyoto Protocol, and the Kyoto Mechanisms”, in: Freestone, David & Charlotte Streck, eds., *Legal Aspects of Implementing the Kyoto Protocol Mechanisms – Making Kyoto Work* (Oxford: Oxford University Press, 2005
- Gehring, Markus, “Systemic Issues in Federal Implementations of Emissions Trading Schemes” [2005] (Presentation given at the conference “Strengthening Climate Cooperation, Compliance & Coherence”, Montreal, Canada: December 2006) [unpublished, on file with the author].
- Haites, Erik, “Harmonisation between National and International Tradeable Permit Schemes: CATEP Synthesis Paper” (Paris: OECD, 2003),
online: <<http://www.oecd.org/dataoecd/11/63/2957623.pdf>>.
- Haites, Erik & Mullins, Fiona, “Linking Domestic and Industry Greenhouse Gas Emissions Trading Systems” (2001), report prepared for EPRI, International energy agency (IEA) and International Emissions Trading Association,
online: <<http://www.wbcsd.org/web/projects/cement/tf1/IETALinking.pdf>>.
- Haites, Erik & Hornung, Robert, *Analysis of Emissions Trading Design Features*, (Ottawa: NRTEE, 1999)
online: NRTEE <www.nrtee-trnee.ca/Publications/PDF/TDESIGNE.pdf>.
- Hardin, Garrett, “The tragedy of the commons”, (1968) 162 Science 1243.
- Hasselknippe, Henrik, “Systems for carbon trading: an overview”, (2003) Climate Policy 3S2 43.
- High Level Group on Competitiveness, Energy and the Environment, “First Report of the High Level Group on Competitiveness, Energy and the Environment contributing to an integrated approach on competitiveness, energy and environmental policies – Functioning of the energy market, access to energy, energy efficiency, and the EU Emissions Trading Scheme” [2006]
[unpublished, on file with the author].
- Höhne, Niklas et al.(ECOFYS GmbH), “Evolution of commitments under the UNFCCC: involving newly industrialized economies and developing countries”, Environmental Research Of The Federal Ministry of the Environment, Nature Conservation and

Nuclear Safety Research Report 201 41 255, UBA-FB 000412 (Berlin: Umweltbundesamt (Federal Environmental Agency), 2003),
online: <<http://www.umweltdaten.de/publikationen/fpdf-l/2235.pdf>>.

Hobley, Anthony & Hawkes, Peter “GHG Emissions Trading Registries”, in: Freestone, David & Charlotte Streck, eds., *Legal Aspects of Implementing the Kyoto Protocol Mechanisms – Making Kyoto Work* (Oxford: Oxford University Press, 2005, p.127.

Ignatieff, Michael, press release, “Kyoto and beyond: Options for long-term reductions in Canada’s greenhouse gas emissions“ (21 August 2006),
online:
<<http://www.michaelignatieff.ca/docs/Forms/Climate%20Change%20Policy%20Outline.pdf>>.

International Organization for Standardization, press release, “New ISO 14064 standards provide tools for assessing and supporting greenhouse gas reduction and emissions trading” (Geneva: ISO, 3 March 2006)
online: <<http://www.iso.org/iso/en/commcentre/pressreleases/2006/Ref994.html>>.

International Climate Change Task Force, “Meeting the Climate Challenge – Recommendations of the international climate change task force” (London, International Climate Change Task Force, January 2005),
Online: Woods Hole Research Center website
<http://www.whrc.org/resources/published_literature/pdf/ByersetalInstPubPolRes.1.05.pdf>, p. 16.

IETA, press release “Historic First Steps Towards Ensuring a Viable Global GHG Market” (21 October 2005),
online: IETA <<http://www.ieta.org/ieta/www/pages/getfile.php?docID=1200>>.

Jinnah, Sikina, Emissions Trading under the Kyoto Protocol: NAFTA and WTO Concerns, 15 *Geo. Int’l. Env’tl. L. Rev.*, 709.

Kurkowski, Susan J., “Distributing the Right to Pollute in the European Union: Efficiency, Equity and the Environment” 14 *N.Y.U. Env’tl L.J.* 698.

Laurikka, Harri “Absolute or Relative Baselines for JI/CDM projects in the Energy Sector?”, *Climate Policy* (2): 19.

Lefevere, Jürgen, “Linking Emissions Trading Schemes: The EU ETS and the ‘Linking Directive’” in: Streck book, p. 511-533.

Main S., Marcela “Pollution Permit Trading in Chile”, in: Freestone & Streck, *supra* note 5, p. 461.

Miceli, Thomas J., “Property”, in: Backhaus, Jürgen G., *The Elgar Companion to Law and Economics* (2nd Ed.), (Cheltenham UK, Northampton, MA: Edward Elgar Publishing Ltd., 2005), 246.

Müller, Benito & Michaelowa, Alexander & Vrolijk, Christian, “Rejecting Kyoto – A study of proposed alternative to the Kyoto Protocol” (*Climate Strategies*, 2001),
online: HWWA
<[http://www.hwwa.de/Projekte/Forsch_Schwerpunkte/FS/Klimapolitik/PDFDokumente/Mueller,%20Michaelowa,%20Vrolijk%20\(2001\).pdf](http://www.hwwa.de/Projekte/Forsch_Schwerpunkte/FS/Klimapolitik/PDFDokumente/Mueller,%20Michaelowa,%20Vrolijk%20(2001).pdf)>.

Nordhaus, Robert R. & Danish, Kyle W., „Assessing the Options for Designing a Mandatory U.S. Greenhouse Gas Emissions Trading Program“ (2005) 32 *B.C. Envtl. Aff. L. Rev.* 97.

Notice of Intent to Regulate Greenhouse Gas Emissions by Large Final Emitters,
C. Gaz. 2001. I. 2489,
online: <<http://canadagazette.gc.ca/partI/2005/20050716/pdf/g1-13929.pdf>>.

Pembina Institute, “Pembina Institute Comments on Environment Canada’s *Notice of Intent to regulate greenhouse gas emissions by Large Final Emitters*, published in the *Canada Gazette Part I*, July 16, 2005” (2005),
online: Pembina Institute
<http://www.pembina.org/pdf/publications/LFE20050914_Notice_Intent_Reg_LFE.pdf>.

Pew Center on Global Climate Change, “Summary of The Lieberman-McCain Climate Stewardship Act”,
online: Pew Center
<http://www.pewclimate.org/policy_center/analyses/s_139_summary.cfm>.

Pew Center on Global Climate Change, “BP CEO Lord Browne’s speech (November 2003)”,
online: Pew Center
<http://www.pewclimate.org/companies_leading_the_way_belc/company_profiles/bp_amoco/browne.cfm>.

Pew Center on Global Climate Change, “Emissions Trading in the US: Experience, Lessons and Considerations for Greenhouse Gases” (2003),
online: Pew Center <<http://www.pewclimate.org/document.cfm?documentID=216>>.

Philibert, Cédric & Pershing, Jonathan, “Considering the options: climate targets for all countries” (2001) 1 *Climate Policy* 211.

Point Carbon, press release, “Unconfirmed Data Shows EU Emissions well below limit”, 12 May 2006,

online: Point Carbon
<http://www.pointcarbon.com/wimages/Press_release_Point_Carbon_12_May_2006_1.pdf>.

Regional Greenhouse Gas Initiative, *Memorandum of Understanding* [2005]
online: Regional Greenhouse Gas Initiative
<http://www.rggi.org/docs/mou_12_20_05.pdf>.

Regional Greenhouse Gas Initiative, *Amendment to Memorandum of Understanding* [2006]
online: Regional Greenhouse Gas Initiative
<http://www.rggi.org/docs/mou_8_8_06.pdf>.

Regional Greenhouse Gas Initiative, *Model Rule (8/15/2006)* [2006]
online: Regional Greenhouse Gas Initiative
<http://www.rggi.org/docs/model_rule_8_15_06.pdf>

Regional Greenhouse Gas Initiative: *Assumption Development Document: Regional Greenhouse Gas Initiative Analysis* [2005],
online: RGGI <http://www.rggi.org/docs/ipm_assumptions_2_10_05.ppt>.

Rio Declaration on Environment and Development, 1992
online: UNEP
<<http://www.unep.org/Documents.multilingual/Default.asp?DocumentID=78&ArticleID=1163>>.

Rypdal, Kristin “Emissions trading: From comprehensive to EU adapted” (21 September 2004),
online: Center for International Climate and Environmental Research Oslo (CICERO)
<<http://www.cicero.uio.no/fulltext.asp?id=2995&lang=no>>.

Schwerd, Joachim, “Das “safety valve”-Konzept im Klimaschutz – Idee und Kritik”,
(2005) *Zeitschrift für Umweltpolitik und Umweltrecht*, 321.

Steenblik, Ronald, “Liberalising Trade in “Environmental Goods”: Some Practical Considerations”, (2005) OECD Trade and Environment Working Paper No. 2005-05,
online: OECD <<http://www.oecd.org/dataoecd/25/8/35978987.pdf>>.

Streck, Charlotte, “Joint implementation: History, Requirements and Challenges”, in:
Freestone, David & Streck, Charlotte, *Legal Aspects of Implementing the Kyoto Protocol mechanisms – Making Kyoto Work* (Oxford, 2005, Oxford University Press), 107.

University College Dublin, “Linking Emissions Trading and Project-Based Mechanisms” [2003] Series Emissions Trading Policy Briefs, No. 5,
online: <<http://www.ucd.ie/pepweb/publications/policybriefs/pb-et-05.pdf>>.

- United States, Government, press release, „Setting the Record Straight: President Bush's Strong Record of Addressing Climate Change” (11 July 2006),
online: White House <<http://www.whitehouse.gov/news/releases/2006/07/20060711-7.html>>.
- U.S. Environmental Protection Agency, *The United States Experience with Economic Incentives for Protecting the Environment*. (Washington, DC: Office of Policy, Economics, and Innovation, 2001)
Online: <[http://yosemite.epa.gov/ee/epa/ermfile.nsf/vwAN/EE-0216B-13.pdf/\\$File/EE-0216B-13.pdf](http://yosemite.epa.gov/ee/epa/ermfile.nsf/vwAN/EE-0216B-13.pdf/$File/EE-0216B-13.pdf)>.
- Van der Weerd, Daniel, “CERUPT and ERUPT Contracts”, in: Freestone & Streck, supra note 5, Streck 313, [hereinafter: Van der Weerd] at p. 314.
- Väyrynen, Jari & Lecocq, Franck, “Track One JI and ‘Greening of AAUs’: How Could it Work?”, in Freestone & Streck, supra note 5, p. 155 [hereinafter: Väyrynen & Lecocq] p. 156,
- Villar, Jose A. & Joutz, Frederick L., “The Relationship between Crude Oil and Natural Gas Prices”, (Energy Information Administration, Office of Oil and Gas, 2006),
online: EIA
<http://www.eia.doe.gov/pub/oil_gas/natural_gas/feature_articles/2006/reloilgaspri/reloilgaspri.pdf>.
- Weitzman, Martin L., “Prices vs. Quantities” (1974) 41 *Review of Economic Studies* 477.
- Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen, „Über Kioto hinaus denken – Klimaschutzstrategien für das 21. Jahrhundert – Sondergutachten“ (Berlin: Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen, 2003),
online: Wissenschaftlicher Beirat Globale Umweltveränderungen<http://www.wbgu.de/wbgu_sn2003.pdf>.
- Werksman, Jacob, “Greenhouse Gas emissions trading and the WTO”, (1999) *RECIEL* 8(3), 251.
- Woerdman, Edwin, “Tradable emission rights”, in: Backhaus, Jürgen G., *The Elgar Companion to Law and Economics* (2nd Ed.), (Cheltenham UK, Northampton, MA: Edward Elgar Publishing Ltd., 2005), p. 364ff.
- World Business Council for Sustainable Development & World Resource Institute, “The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard” (2004),
online: <<http://www.ghgprotocol.org/DocRoot/sA8d8PHg3bcUOqFFYFDO/ghg-protocol-revised.pdf>>.

World Business Council for Sustainable Development & World Resource Institute, “The GHG Protocol for Project Accounting” (2005),
online: <<http://www.ghgprotocol.org/DocRoot/sA8d8PHg3bcUOqFFYFDO/ghg-protocol-revised.pdf>>.

Yandle, Bruce, “From Local to Global Commons: Private Property, Common Property and Hybrid Property Regimes: Grasping for the heavens: 3-D Property rights and the Global Commons” (1999) 10 *Duke Env't'l L. & Pol'y F.*, 13, at p.23.