

## DESIGNING CLIMATE CHANGE LAW: A COMPARATIVE ANALYSIS OF THE US AND THE EU

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### ABSTRACT

*As evidence of anthropogenic climate change mounts there is a growing concern with, and a pressing need for, legal regimes to curtail the problem. This concern culminated in the recent climate change conference in Copenhagen. The US and the EU, as two of the largest contributors to the problem and as entities wielding significant political power, have a pivotal role to play in the creation and development of these regimes. With this in mind, this paper provides a brief survey of the measures taken in the respective jurisdictions to date to combat climate change. Starting with the Kyoto Protocol, the divergent approaches of the two jurisdictions will be noted and the effectiveness of the two regimes discussed, both in terms of emissions reduction and intangible benefits that have arisen. Some 'best practice' principles for the design of climate change law will be discerned, suggesting ways in which future climate change law can be more effective.*

### A INTRODUCTION

The Intergovernmental Panel on Climate Change ('IPCC')<sup>1</sup> has stated that 'warming of the climate system is unequivocal.'<sup>2</sup> According to the IPCC

Global Greenhouse Gas (GHG) emissions due to human activities have grown since pre-industrial times, with an increase of 70% between 1970 and 2004... Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations.<sup>3</sup>

Both the US<sup>4</sup> and the EU<sup>5</sup> agree with this statement, repeating it almost verbatim. In addition, most scientists,<sup>6</sup> including the national academies of science of many major industrialized nations,<sup>7</sup> are also convinced of the validity of the science of climate change. Thus, most of

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<sup>1</sup> 'The IPCC is a scientific intergovernmental body set up by the World Meteorological Organization (WMO) and by the United Nations Environment Programme (UNEP).' It is mandated to 'provide the decision-makers and others interested in climate change with an objective source of information about climate change.'  
<<http://www1.ipcc.ch/about/index.htm>> (27 February 2010).

<sup>2</sup> IPCC *Climate Change 2007: Synthesis Report*, Summary for Policymakers.  
<[http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr\\_spm.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf)> (27 February 2010).

<sup>3</sup> *ibid.*

<sup>4</sup> 'Most of the warming in recent decades is very likely the result of human activities.' US Environmental Protection Agency: Climate Change Basic Information  
<<http://www.epa.gov/climatechange/basicinfo.html>> (27 February 2010).

<sup>5</sup> 'The warming of the climate system is unequivocal... Most of the warming that has occurred over the last 50 years is very likely to have been caused by human activities.' —'Climate Change' EUROPA  
<[http://ec.EUROPA.eu/environment/climat/home\\_en.htm](http://ec.EUROPA.eu/environment/climat/home_en.htm)> (27 February 2010).

<sup>6</sup> Doran and Zimmerman 'Examining the Scientific Consensus on Climate Change' (2009) 90(3) *Eos*, Transactions American Geophysical Union.

<sup>7</sup> Joint Science Academies, Climate Change Adaptation and the Transition to a Low Carbon Society Royal Society, 06/2008.

the world is now at an agreement and, as a starting point, the two entities which are the subject of this paper are in agreement as to the science of global warming.

According to the UN, the US currently contributes 22.2% of global Carbon Dioxide emissions<sup>8</sup> and the EU contributes 14.7%.<sup>9</sup> While these figures were collected in 2004 and are now somewhat inaccurate,<sup>10</sup> they certainly indicate the large scale of the contribution of the US and the EU.

The US, as a 'superpower',<sup>11</sup> and the EU, which bears, or may come to bear, the same title,<sup>12</sup> are entities of similar economic size,<sup>13</sup> and hold a great deal of influence in the international political sphere; influence which could be wielded in the battle against global warming. Thus, it is difficult to understate the importance of these two entities both acting and leading in the battle against climate change.

It has been noted that both the US and the EU are in agreement as regards science, that both contribute significantly to CO<sub>2</sub> emissions, and that both are entities of substantial power. This paper, then, will provide a broad survey of the regimes for abating climate change in both the US and the EU, federally and regionally, focusing on legally binding and compulsory laws, schemes and policies. It will critically assess which of the operational measures, if any, have been effective in reducing emissions and providing other benefits, and assess, compare and evaluate the design of the measures, with a view to determining the potential for, and likelihood of, their success. This analysis will suggest the best design practice for future climate change laws and policies. Finally, this paper will provide a brief insight into the future of climate change regulation.

## B FEDERAL LEVEL MEASURES

### 1 The EU

A fundamental difference between the regulatory regimes of the US and the EU is the Kyoto protocol.<sup>14</sup> The US signed,<sup>15</sup> but did not ratify,<sup>16</sup> the protocol. As opposed to this is the EU,

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<sup>8</sup>The Official UN Site for the MDG Indicators: Carbon dioxide emissions (CO<sub>2</sub>), thousand metric tons of CO<sub>2</sub> (CDIAC) <<http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749&crid>> (27 February 2010).

<sup>9</sup> *ibid.*

<sup>10</sup> This is largely due to the vast increase in China's emissions over the ensuing years. Sources now suggest that China has in fact superseded the US as the largest emitter of CO<sub>2</sub>. Netherlands Environment Agency Climate Change Dossiers 'China now no. 1 in CO<sub>2</sub> emissions; USA in second position'

<<http://www.pbl.nl/en/news/pressreleases/2007/20070619Chinanowno1inCO2emissionsUSAinsecondposition.html>> (27 February 2010).

<sup>11</sup> Though not the only power, as it operates in 'a strange hybrid [international political system], a uni-multipolar system with one superpower and several major powers.' Huntington 'The Lonely Superpower' (1999) 78(2) *Foreign Affairs* 35.

<sup>12</sup> M Leonard 'Europe: the New Superpower' *The Irish Times* (Dublin Ireland 18 February 2005); P Khanna *The Second World: Empires and Influence in the New Global Order* (Random House 2008).

<sup>13</sup> Posen 'Fleeting Equality: The Relative Size of the US and EU Economies to 2020' [2004] US-Europe Analysis Series (The Brookings Institution) <<http://www.brookings.edu/fp/cuse/analysis/posen20040901.pdf>> (27 February 2010).

<sup>14</sup> Kyoto Protocol to the United Nations Framework Convention on Climate Change (adopted 11 December 1997, entered into force 16 February 2005).

<sup>15</sup> Then Vice-President Al Gore signed the Protocol, but indicated that ratification would not be sought. — 'Clinton Hails Global Warming Pact, But early Senate ratification is unlikely' CNN <<http://edition.cnn.com/ALLPOLITICS/1997/12/11/kyoto/>> (27 February 2010).

<sup>16</sup> The US Senate passed (by a unanimous 95–0 vote) a resolution stating that 'the United States should not be a signatory to any protocol' that did not mandate emissions caps for developing nations and that may harm the US

whose then 15 Member States,<sup>17</sup> each ratified the protocol. The Kyoto protocol commits each state to a reduction in GHG emissions against 1990-levels by 2012, but the EU decided to meet its cuts collectively; an 8% reduction in GHG emissions across all Member States.<sup>18</sup>

(a) GHG Emission Allowance Trading

The EU's primary means<sup>19</sup> of meeting its reduction target is the GHG emissions trading scheme.<sup>20</sup> This came into effect in January 2005 and includes a number of installations and activities,<sup>21</sup> accounting for 40% of the EU's total emissions.<sup>22</sup> This makes it the 'largest multi-country, multi-sector Greenhouse Gas emission trading scheme world-wide.'<sup>23</sup> It is a 'cap-and-trade' system, setting a maximum level of emissions and allowing parties to trade in allowances. The first trading period ('phase one') included all then 15 Member States and set caps based on National Action Plans ('NAPs'), which were reviewed by the European Commission.

Phase two is 'crucial' as it coincides with the Kyoto compliance period.<sup>24</sup> Emissions caps have been reduced by 6.5% overall as compared to the phase one caps, in order to ensure Kyoto compliance.<sup>25</sup> In addition, the scope of the Emissions Trading Scheme ('ETS') has been broadened to accommodate joint implementation and the clean development mechanism,<sup>26</sup> two of the 'flexibility mechanisms' of the Kyoto Protocol, and include the participation of three non-EEA Member States.<sup>27</sup>

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economy. Byrd-Hagel Resolution, Senate Res 98 (105 Cong 1st Session) <<http://www.nationalcenter.org/KyotoSenate.html>> (27 February 2010).

<sup>17</sup> The fifteen Member States were Belgium, France, Italy, Luxembourg, Netherlands, Germany, Denmark, Ireland, United Kingdom, Greece, Portugal, Spain, Austria, Finland and Sweden.

<sup>18</sup> 'EU-15 on target for Kyoto, despite mixed performances' EEA Pressroom <<http://www.eea.europa.eu/pressroom/newsreleases/eu-15-on-target-for-kyoto-despite-mixed-performances>> (27 February 2010).

<sup>19</sup> Ellerman and Buchner 'The European Union Emissions Trading Scheme: Origins, Allocation, and Early Results, Review of Environmental Economics and Policy' (2007) Review of Environmental Economics and Policy 66.

<sup>20</sup> Directive 2003/87/EC of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

<sup>21</sup> The scheme covers 'above certain capacity thresholds, power stations and other combustion plants, oil refineries, coke ovens, iron and steel plants and factories making cement, glass, lime, bricks, ceramics, pulp, paper and board.' MEMO/08/35 Questions and Answers on the Commission's proposal to revise the EU Emissions Trading System.

<sup>22</sup> *ibid.*

<sup>23</sup> 'Emission Trading System (EU ETS)' EUROPA <[http://ec.europa.eu/environment/climat/emission/index\\_en.htm](http://ec.europa.eu/environment/climat/emission/index_en.htm)> (27 February 2010); Ellerman and Buchner (n 19).

<sup>24</sup> MEMO/08/35 (n 21).

<sup>25</sup> '...the Commission has capped national emissions from EU ETS sectors at an average of around 6.5% below 2005 levels.' *ibid.*

<sup>26</sup> Directive 2004/101/EC 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.

<sup>27</sup> 'Iceland, Norway, Liechtenstein to join EU emissions trading system' EU business <<http://www.eubusiness.com/Environ/1193418125.05>> (27 February 2010).

## (b) Effectiveness

When assessing the effectiveness of the EU scheme, it is convenient to analyse the data in terms of the phases of operation of the ETS.

The EU itself acknowledged that, as the first period of trade under the ETS, phase one was a ‘learning by doing’ exercise,<sup>28</sup> and noted a number of issues with the system. The main criticism levelled at,<sup>29</sup> and addressed by, the EU was that ‘the environmental benefit of the first phase may [have been] limited due to excessive allocation of allowances by some Member States.’<sup>30</sup> This resulted from the NAP procedure; there being no harmonised rules for establishing caps and allowances, most States did not set a cap sufficiently low as to achieve an emissions reduction.<sup>31</sup> When verified emissions data was published, this excess became clear, market prices dropped significantly.<sup>32</sup> This ‘underlin[es] the need for verified data, [and shows] that greater harmonisation within the EU ETS is imperative’ for the effective operation of the ETS.<sup>33</sup> Despite these issues, the EU remained confident that the ETS ‘proved that trading in greenhouse gas emissions works’<sup>34</sup> and that the ETS made crucial infrastructural and methodological advancements.

The figures show that the EU increased its overall emissions by 1.9% in phase one,<sup>35</sup> but that only a 0.68% increase occurred between 2006-7, well below the 1.9% increase in GDP,<sup>36</sup> which suggests that the system started to become effectual. Sixty-eight facilities failed to surrender sufficient allocations to cover their emissions, but these only accounted for an insignificant amount of total allocations (<0.08%).<sup>37</sup>

The slight increase in emissions in phase one ‘underline[d] the need for the tighter emission caps.’<sup>38</sup> This need was met by the Commission who, in considering whether to adopt Member States’ NAPs as submitted or to amend them, adopted decisions designed to send a ‘strong signal’ of the EU’s commitment to Kyoto<sup>39</sup> and ‘iron out’ the disparities caused by the lack of a harmonised NAP procedure.<sup>40</sup> This resulted in a lowering of the

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<sup>28</sup> MEMO/08/35 (n 21).

<sup>29</sup> Climate Action Network Europe *National Allocation Plans 2005-7: Do They Deliver? Key Lessons For Phase II of the EU ETS* (2006).

<sup>30</sup> MEMO/08/35 (n 21).

<sup>31</sup> According to the National Allocation Plans 2005-7 (n 29), only 2 States, the UK and Germany, actually set a cap which resulted in an emissions cut as compared to 1990 levels.

<sup>32</sup> MEMO/08/35 (n 21).

<sup>33</sup> *ibid.*

<sup>34</sup> *ibid.*

<sup>35</sup> —‘ Emissions trading: 2007 verified emissions from EU ETS businesses’ EUROPA <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/787>> (27 February 2010).

<sup>36</sup> *ibid.*

<sup>37</sup> *ibid.*

<sup>38</sup> *ibid.*

<sup>39</sup> —‘ Emissions trading: Commission adopts decision on Italy’s national allocation plan for 2008-2012’ EUROPA <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/667&format=HTML&aged=0%3Cuage=EN&guiLanguage=en>> (27 February 2010).

<sup>40</sup> ‘The Commission is assessing all national plans in a consistent way to ensure equal treatment of Member States.’ —‘Emissions trading: Commission decides on second set of national allocation plans for the 2008-2012 trading period’ EUROPA <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/51&format=HTML&aged=0&language=EN>> (27 February 2010).

proposed cap and the application of a more stringent target in a number of cases,<sup>41</sup> sometimes involving a very substantial reduction.<sup>42</sup>

It will not be known for sure whether these decisions have had the desired impact on emissions until verified data is submitted following the end of phase two in 2012. However, some pessimistic preliminary assessments have been made. One such initial assessment concluded that there is a significant disparity between States' quoted business as usual ('BAU') scenario and the BAU scenario as independently assessed, thus leading, once again, to NAPs with higher allowance allocations than would be required for States to effect emissions reductions.<sup>43</sup> Despite some uncertainty as to the correctness of these results,<sup>44</sup> the conclusion that 'the level of a number of caps is not ambitious enough to put Member States on a path to reach their Kyoto target without Government purchase of JI/CDM credits' seems to stand. On the other hand, the inclusion of the CDM itself may become a problem; the investment in CDM products could risk causing an 'oversupply of tradable CO2 emissions... resulting in a significant downside price risk.'<sup>45</sup> Other sources suggest that, as in phase one, the allocation system could result in windfalls, especially in the power sector.<sup>46</sup>

Most recently, carbon prices have once again dropped to a very low level,<sup>47</sup> which raises similar concerns as to the effectiveness of the scheme raised in phase one. While it is clear that the jury is still out on the efficacy of phase two, it is equally clear that the 'learning by doing' has not yet ended, and that significant challenges to the effectiveness of the ETS remain.

### (c) The Future of the EU ETS: Phase Three

The Commission have acknowledged that the NAP approach has 'generated significant differences in allocation rules, creating an incentive for each Member State to favour its own industry, and has led to great complexity.'<sup>48</sup> Thus, in January 2008, the Commission proposed an amending directive<sup>49</sup> as part of the EU Climate and Energy Package, which was

<sup>41</sup> *ibid.*

<sup>42</sup> An example is Estonia, whose NAP proposed cap was reduced by nearly 48%. —'Emissions trading: Commission adopts decision on Estonia's national allocation plan for 2008-2012' EUROPA <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/613>> (27 February 2010).

<sup>43</sup> *Ecofys Initial Assessment of National Allocation Plans For Phase II of the EU Emission Trading Scheme* <[http://www.ecofys.com/com/publications/documents/Ecofys\\_Summary\\_InitialNAP2\\_Assessment.pdf](http://www.ecofys.com/com/publications/documents/Ecofys_Summary_InitialNAP2_Assessment.pdf)> (27 February 2010).

<sup>44</sup> *ibid.* Note that this assessment was conducted based on the NAPs as they were pre-approval. The Commission, MEMO/08/35 (n 21), reduced the caps for phase two by 6.5%. The assessment suggests a 2.5% surplus in allowances when based on the independent BAU analysis.

<sup>45</sup> —'CER imports pose risk of EUA oversupply in EU Emissions Trading Scheme Phase II' Wood Mackenzie Press Releases: Energy <<http://www.woodmacresearch.com/cgi-bin/corp/portal/corp/corpPressDetail.jsp?searchStr=concludes&oid=872278&origSessionID=@@@@1511970731.1262177774@@@@&origEngineID=cccdadejeleleklclflgcegjdfjdgi.0>> (27 February 2010).

<sup>46</sup> Point Carbon EU ETS Phase II – The Potential and Scale of Windfall Profits in the Power Sector, Commissioned by WWF <[http://assets.panda.org/downloads/point\\_carbon\\_wwf\\_windfall\\_profits\\_mar08\\_final\\_report\\_1.pdf](http://assets.panda.org/downloads/point_carbon_wwf_windfall_profits_mar08_final_report_1.pdf)> (3 March 2010).

<sup>47</sup> —'EU carbon price hits record low for 2008-12' Reuters <<http://www.reuters.com/article/idUSTRE5123IJ20090203>> (27 February 2010).

<sup>48</sup> MEMO/08/35 (n 21).

<sup>49</sup> COM(2008) 16 final 2008/0013 (COD) Proposal for a DIRECTIVE amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading system of the Community.

subsequently adopted in December 2008.<sup>50</sup> This directive will come into force for the third phase of the ETS and will make considerable changes designed to finally enable the ETS to be a fully functioning carbon market. These changes include a longer trading period, replacement of the NAPs caps with an EU (federal) level cap, reducing the number of free allocations and increasing the level of auctioning.<sup>51</sup>

In late 2006 it was proposed that aviation should be included in the ETS.<sup>52</sup> After much consultation<sup>53</sup> and negotiation,<sup>54</sup> a directive was passed in November 2008 to effect this proposal.<sup>55</sup>

## 2 The US

The US has not signed the Kyoto Protocol<sup>56</sup> and recent administrations have largely relied on voluntary initiatives to reduce the growth of greenhouse gas emissions<sup>57</sup> – of the fifty or so measures detailed in the US's Fourth Climate Action Report,<sup>58</sup> only seven were described as 'regulatory'.<sup>59</sup> US measures include the Energy Policy Act of 2005 which, 'in addition to R&D programs, has a number of provisions designed to accelerate market penetration of advanced, clean-energy technologies',<sup>60</sup> and the Renewable Fuel Standard<sup>61</sup> which is 'intended to double the amount of renewable fuel usage by 2012.'<sup>62</sup> The Energy Independence and Security Act of 2007 does include provisions specifically on climate change, including requirements for the use of renewable fuels,<sup>63</sup> and the establishment of an office<sup>64</sup> to implement research on mitigating the causes and addressing the effects of climate change on transportation.<sup>65</sup> However, these provisions are transport-centric and do not pertain to wider climate change related regulation.

<sup>50</sup> —'Climate change: Commission welcomes final adoption of Europe's climate and energy package' EUROPA <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1998>> (27 February 2010).

<sup>51</sup> See COM(2008) (n 49).

<sup>52</sup> COM(2006) 818 final 2006/0304 (COD) Proposal for a directive amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community.

<sup>53</sup> —'Climate change: public consultation underlines support for tackling aviation's contribution' EUROPA <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/05/1024&format=HTML&aged=1&language=EN&guiLanguage=fr>> (27 February 2010).

<sup>54</sup> For passage of the directive generally see 2006/0304 (COD), Monitoring of the decision-making process between institutions <[http://ec.EUROPA.eu/prelex/detail\\_dossier\\_real.cfm?CL=en&DosId=195168#383040](http://ec.EUROPA.eu/prelex/detail_dossier_real.cfm?CL=en&DosId=195168#383040)> (27 February 2010).

<sup>55</sup> Directive 2008/101/EC of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community.

<sup>56</sup> Byrd-Hagel Resolution (n 16).

<sup>57</sup> Congressional Research Service Report prepared for Members and Committees of Congress *Climate Change: Federal Laws and Policies Related to Greenhouse Gas Reductions* <<http://www.cnire.org/NLE/CRSreports/06Mar/RL31931.pdf>> (27 February 2010).

<sup>58</sup> Bureau of oceans and International Environmental and Scientific Affairs Fourth Climate Action Report to the UN Framework Convention on Climate Change 2006 <<http://www.state.gov/g/oes/rls/rpts/car/>> (3 March 2010).

<sup>59</sup> Congressional Research Service Report (n 57).

<sup>60</sup> Bureau of Oceans Report (n 58). Though these provisions are only 'indirectly related to greenhouse gas emissions' *ibid*.

<sup>61</sup> Under the Energy Policy Act of 2005, the Environmental Protection Agency is responsible for promulgating regulations to ensure that gasoline sold in the United States contains a specific volume of renewable fuel.

<sup>62</sup> Bureau of Oceans Report (n 58).

<sup>63</sup> Energy Independence and Security Act of 2007 (US) s 202.

<sup>64</sup> Office of Climate Change and Environment in the Department of Transportation.

<sup>65</sup> *ibid*.

The lack of federal legislation comes at the expense of concerted efforts by a number of Congress persons to effect such legislation. A number of bills have been introduced into Congress, attempting various levels of climate change regulation, and reaching equally varied levels of the legislative process. In the 110<sup>th</sup> Congress alone there were ‘more than 235 bills, resolutions, and amendments specifically addressing global climate change and greenhouse gas emissions’,<sup>66</sup> including no fewer than 10 proposals for an economy-wide cap-and-trade system, most of them aiming for either a reduction to 1990 levels by 2020<sup>67</sup> or a percentage reduction on 2005 levels by 2020.<sup>68</sup> None of these comprehensive cap-and-trade bills were passed.<sup>69</sup>

The failure of the US government to take a robust and vigorous approach to climate change regulation spurred the environmental movement into action, leading a number of cases to the Supreme Court in the hope of strengthening action on climate change. These cases have included claims of public nuisance<sup>70</sup> and arguments against States being preempted from regulating to stricter standards than those promulgated by the Federal Government.<sup>71</sup> Perhaps the most important, as a victory for environmental activists, and well-known of these cases is *Massachusetts v EPA*.<sup>72</sup> In this case, the Supreme Court held that the petitioners had standing,<sup>73</sup> that the EPA has the authority to regulate tailpipe emissions of carbon dioxide and, finally, that the EPA’s rationale for not regulating such emissions was inadequate. It was held that it must be reviewed and either a new, reasonable rationale for inaction be articulated, or regulation implemented. These challenges, however, have achieved mixed results and have not necessarily been favorable to the furtherance of climate change regulation.<sup>74</sup> This strategy of litigation can be seen to be an ineffective substitute for a Federal program of regulation, where litigation would be a mechanism of enforcement, rather than a means of attempting to incorporate climate change into existing legal enactments and doctrine.

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<sup>66</sup> —‘Climate Action in Congress, US Climate Change Legislation’ Pew Center on Global Climate Change <[http://www.pewclimate.org/what\\_s\\_being\\_done/in\\_the\\_congress](http://www.pewclimate.org/what_s_being_done/in_the_congress)> (27 February 2010).

<sup>67</sup> *ibid.*

<sup>68</sup> *ibid.*

<sup>69</sup> For a brief discussion of the politics see Cohen ‘Is the latest climate change bill getting warmer? Lieberman-Warner proposal is a centrist compromise looking for bipartisan support’, *The Wall Street Journal Digital Network: Market Watch* <<http://www.marketwatch.com/story/is-the-latest-climate-change-bill-getting-warmer>> (28 February 2010).

<sup>70</sup> *California v General Motors Corp* 2007 WL 2726871 (ND Cal 2007); *Connecticut v American Electric Power Company* 406 F Supp 2d 265 (SDNY 2005).

<sup>71</sup> *Central Valley Chrysler-Jeep v Witherspoon* No CV-04-6663 (ED Cal 2006); *Center for Biological Diversity v NHTSA* No 06-71891 (9th Cir filed 12 April 2006).

<sup>72</sup> *Massachusetts v Environmental Protection Agency* 549 US 4917 (2007).

<sup>73</sup> States: California, Connecticut, Illinois, Maine, Massachusetts, New Jersey, New Mexico, New York, Oregon, Rhode Island, Vermont and Washington; Cities: New York, Baltimore, and Washington DC; the territory of American Samoa; Organizations: Center for Biological Diversity, Center for Food Safety, Conservation Law Foundation, Environmental Advocates, Environmental Defense, Friends of the Earth, Greenpeace, International Center for Technology Assessment, National Environmental Trust, Natural Resources Defense Council, Sierra Club, Union of Concerned Scientists, and US Public Interest Research Group.

<sup>74</sup> In the nuisance cases (n 70), the cases failed on the ground that the question of CO<sub>2</sub> emissions is of a political nature and is properly decided by the legislation. The pre-emption cases are, as yet, undecided. In *Central Valley Chrysler-Jeep* (n 71), proceedings were stayed pending a decision in *Massachusetts v Environmental Protection Agency* (n 72). Presumably, given the outcome in that case, the State will not be held to be pre-empted.

## (a) Effectiveness

The lack of a clear cause and effect link (such as linking the cap in the EU system with reductions in emissions), owing to the indirect nature of the provisions, makes determining whether any emissions cuts made were a result of Federal measures inherently difficult. Further difficulty arises from the lack of availability of statistics after the enactment of the 2007 Act. However, there are a number of self-evident observations that may be said to impact on the effectiveness of the US legal effort. The main criticism of the US regime is that there is a lack of a broad, overarching and cohesive policy aimed at reducing emissions. This has resulted in piecemeal advancement of climate regulation and the spread of climate-related provisions across a number of acts. A further criticism is that there are few measures of a compulsory nature. While encouraging technological advancements through a free-market system may be an admirable goal, industry and businesses may be reluctant to invest in unproven technologies. Measuring how effective such voluntary measures are is inherently difficult and they have, thus far, only been 'subject to quite limited evaluation.'<sup>75</sup> Where such evaluation exists, it tends to suggest that the impact of voluntary programs is very small.<sup>76</sup>

Reports suggest that the total US emissions had increased by 15% on 1990 levels by 2006,<sup>77</sup> encompassing a 1.1% drop in emissions between 2005-2006<sup>78</sup> but a 1.4% increase between 2006-2007.<sup>79</sup> The Bush administration's goal had been to focus on the reduction of carbon intensity,<sup>80 81</sup> yet the 0.6% decrease in carbon intensity between 2006-2007 was one of the smallest decreases yet to be recorded.<sup>82</sup>

The Energy Information Administration ('EIA') predicts decreases of 1.8% and 1.1% between 2007-2008 and 2008-2009 respectively, but a 10% increase from 2009 levels by 2030.<sup>83</sup> While these predictions are lower than were expected,<sup>84</sup> it is clear that the figures do not represent the kinds of emissions reductions thought to be needed to avert the worst effects of climate change.

These figures, despite some uncertainty, seem to show that the current Federal climate change regime has failed to effectively reduce emissions. Furthermore, although regulatory

<sup>75</sup> Pizer Morgenstern and Shih Resources for the Future Discussion Paper 08-13 *Evaluating Voluntary Climate Programs in the United States*

<<http://www.rff.org/rff/documents/rff-dp-08-13.pdf>> (28 February 2010).

<sup>76</sup> For example, after subjecting the US EPA's 'Climate Wise' and the US Department of Energy's 'Voluntary Reporting of Greenhouse Gases' programs to rigorous statistical analysis, Pizer et al, *ibid*, conclude:

In contrast to the claims of relatively large emissions reductions reported by the sponsoring agencies, our analysis suggests that more modest reductions are attributable to the programs studied. Overall, we find that that the effects of [the programs] on fuel and electricity expenditures were no more than 10 percent and probably less than 5 percent. We found no evidence of reductions in direct emissions from fossil fuels attributable to the voluntary programs.

<sup>77</sup> US Department of Energy Office of integrated Analysis and Forecasting Annual Energy Review 2007 <<http://www.eia.doe.gov/emeu/aer/contents.html>> (3 March 2010).

<sup>78</sup> US Environmental Protection Agency *Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006* Figure ES-2 p ES-4 <[http://www.epa.gov/climatechange/emissions/downloads/08\\_CR.pdf](http://www.epa.gov/climatechange/emissions/downloads/08_CR.pdf)> (28 February 2010).

<sup>79</sup> Yacobucci and Parker US Department of Energy: Energy Information Administration *Emissions of Greenhouse Gases in the United States 2007* 1 <<http://ftp.eia.doe.gov/pub/oiaf/1605/cdrom/pdf/ggprt/057307.pdf>> (28 February 2010).

<sup>80</sup> Measured as metric tons carbon dioxide equivalent emitted per million dollars of gross domestic product. *ibid*.

<sup>81</sup> —'Analysis of President Bush's Climate Change Plan' Pew Center on Global Climate Change <[http://www.pewclimate.org/policy\\_center/analyses/response\\_bushpolicy.cfm](http://www.pewclimate.org/policy_center/analyses/response_bushpolicy.cfm)> (28 February 2010).

<sup>82</sup> US Department of Energy: *Emissions of Greenhouse Gases in the United States 2007* (n 79).

<sup>83</sup> Based on US Department of Energy: Energy Information Administration *Annual Energy Outlook 2009 Early Release with Projections to 2030* <[http://www.eia.doe.gov/oiaf/aeo/pdf/0383\(2009\).pdf](http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2009).pdf)> (28 February 2010).

<sup>84</sup> —'US carbon output slower than thought by 2030: EIA' Reuters <<http://www.reuters.com/article/idUSTRE4BG4HW20081217>> (28 February 2010).



measures are only a ‘small subset’ of the US effort, it has been said that they ‘account for a large share of greenhouse gas emission reductions achieved over the past decade-and-a-half.’<sup>85</sup> Thus it is likely that the figures would be worse if not for the modest regulatory efforts made, and that the problem lies in the heavy reliance on technology innovation incentives and voluntary, non-compulsory programs.

## C REGIONAL MEASURES

### 1 The EU

Under the pseudo-federalist EU system, each Member State is responsible directly for reducing its emissions to meet its Kyoto target. This has resulted in varied measures and policies across Member States,<sup>86</sup> including the promotion of energy efficiency and renewable energy sources, and changes in tax provisions and educational programs, such as promoting cycling and walking. Even looking beyond Kyoto, some States are moving toward further, and more stringent, national measures to curb climate change.

#### (a) The UK Climate Change Act 2008

It is in this regard that the UK is worthy of particular consideration. In November 2008, the UK parliament passed the Climate Change Act,<sup>87</sup> heralded as the ‘world’s first long term legally binding framework to tackle the dangers of climate change’.<sup>88</sup> The Act places a duty on the Secretary of State ‘to ensure that the net UK carbon account for the year 2050 is at least 80% lower than the 1990 baseline.’<sup>89</sup> The Secretary of State must set carbon budgets for five year periods with a view to meeting this overall goal;<sup>90</sup> each budget must represent a decrease in emissions of at least 26% on 1990 levels.<sup>91</sup> The Committee on Climate Change<sup>92</sup> has now published its first recommendations,<sup>93</sup> for the first set of budget periods,<sup>94</sup> ahead of the Secretary of State’s own deadline of June 2009.<sup>95</sup> The Committee proposed two recommendations for each period; an ‘interim’ budget, for emissions reductions pending an international agreement, and an ‘intended’ budget, with an increase in reductions in the event of such an agreement. The intended budgets represent an emissions reduction of 42% in 2020, relative to 1990.<sup>96</sup>

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<sup>85</sup> US Department of Energy: *Emissions of Greenhouse Gases in the United States 2007* (n 79).

<sup>86</sup> For actions of Member States generally, see —‘Greenhouse gas monitoring and reporting: Country profiles, Climate Change’ EUROPA <[http://ec.europa.eu/environment/climat/gge\\_country.htm](http://ec.europa.eu/environment/climat/gge_country.htm)> (28 February 2010).

<sup>87</sup> Climate Change Act 2008 (UK).

<sup>88</sup> Defra website <<http://www.defra.gov.uk/ENVIRONMENT/climatechange/uk/legislation/>> (28 February 2010).

<sup>89</sup> Climate Change Act (n 87).

<sup>90</sup> *ibid* s 4.

<sup>91</sup> *ibid* s 5.

<sup>92</sup> Established under the Climate Change Act, Part two. The Committee is charged with advising the Secretary of State on the level of the carbon budget for each period.

<sup>93</sup> Committee on Climate Change *Building a low-carbon economy – The UK’s contribution to tackling climate change* <<http://www.theccc.org.uk/reports/building-a-low-carbon-economy>> (28 February 2010).

<sup>94</sup> Climate Change Act (n 87) s 4(2)(a).

<sup>95</sup> *ibid*.

<sup>96</sup> Committee on Climate Change (n 93).

Given that the UK Act is new, it is impossible to determine any effect thus far. However, what is clear is that the UK Act is a strong, legally binding commitment to reducing emissions.

## 2 The US

As well as inviting litigation, the inaction of the Federal Government may well have prompted the apparent enthusiasm of States, cities, and even Mayors<sup>97, 98</sup> of the US, to take action on climate change. In the absence of strong federal measures, it appears that this array of regional developments will be responsible for reducing the level of US emissions. A number of States have now enacted legislation which expressly seeks to cap emissions at a given level, some have entered into regional climate change agreements, and many have initiated climate action plans.<sup>99</sup>

### (a) State-Level Targets

The States of California, Connecticut, Maine, Massachusetts, Minnesota, New Jersey, Hawaii, Oregon and Washington<sup>100</sup> have all taken the legislative route, giving legal weight to emissions reduction targets; five other State Governors have issued executive orders to a similar effect.<sup>101</sup>

While it is clear that these legislative targets send a strong message, their success will depend on the actions taken in their pursuit. To this end eight of the nine States with legislative targets have acceded to one of the regional arrangements discussed below – Hawaii being the only State not to have done so.<sup>102</sup> Thus, they have a State legislative target, as well as a target under an intergovernmental agreement. With both of these in place, it is clear that the curbing of global warming has significant legal and political weight. Of the five

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<sup>97</sup> The US Mayors Climate Protection Agreement (As endorsed by the 73rd Annual US Conference of Mayors meeting Chicago 2005) urges the Federal Government to ‘enact policies and programs to meet or beat the target of reducing global warming pollution levels to 7 percent below 1990 levels by 2012;’ calls on Congress to ‘pass bipartisan greenhouse gas reduction legislation that includes clear timetables and emissions limits, and a flexible, market-based system of tradable allowances among emitting industries;’ and states that ‘[w]e will strive to meet or exceed Kyoto Protocol targets for reducing global warming pollution by taking actions in our own operations and communities.’ Available at <<http://www.usmayors.org/climateprotection/documents/mcpAgreement.pdf>> (28 February 2010).

<sup>98</sup> As of 28 February 2010, 1017 mayors from all 50 States, the District of Columbia and Puerto Rico, representing 86,652,633 citizens, have signed the list. See *List of Participating Mayors* Climate Protection Center Website <<http://www.usmayors.org/climateprotection/list.asp>> (28 February 2010).

<sup>99</sup> As of August 2008, 32 States had implemented climate action plans; six were in the process of formulating plans. Climate Change Action Plan, State Planning and Measurement, EPA Website, <[http://www.epa.gov/climatechange/wycd/stateandlovalgov/state\\_planning.html](http://www.epa.gov/climatechange/wycd/stateandlovalgov/state_planning.html)> (2 November 2009).

<sup>100</sup> Global Warming Solutions Act 2006; House Bill 5600 2008; Act to Provide Leadership in Addressing the Threat of Climate Change 2003; Global Warming Solutions Act 2008; Next Generation Energy Act 2007; Global Warming Response Act 2007; Global Warming Solutions Act 2007; House Bill 3543 2007; Engrossed Substitute Senate Bill 6001 2007.

<sup>101</sup> Arizona (Executive Order 2006-13); Colorado (Executive Order D-004-08); New Mexico (Executive Order 2005-033); Florida (Executive Order 07-127); Virginia (Executive Order 59).

<sup>102</sup> The per capita emissions rate in Hawaii is less than half that of the US generally. Alber (ed) *Inventory of Hawaii greenhouse gas Emissions: Estimates for 1990* (State of Hawaii, Dept. of Business, Economic Development, and Tourism, Energy, Resources, and Technology Division, and Dept. of Health, Clean Air Branch 1997).

States issuing executive orders, two are part of a regional agreement.<sup>103</sup> Thus in total, 10 States have given ‘dual weight’ to the goal of reducing emissions. The remaining three States with targets, but no accession to a regional agreement, all have climate action plans.<sup>104</sup>

## D REGIONAL AGREEMENTS

### 1 The Regional Greenhouse Gas Initiative of the Northeastern States (‘RGGI’)

The RGGI is a cap and trade system, participated in by 10 States,<sup>105</sup> and is the ‘first mandatory cap-and-trade program in the United States for carbon dioxide’,<sup>106</sup> and covers certain ‘fossil fuel fired’ power generation plants<sup>107</sup> (approximately 225 in total).<sup>108</sup> It begins by capping emissions from included facilities at 2009 levels initially,<sup>109</sup> and then reducing these emissions 10% by 2018;<sup>110</sup> meaning a 2.5% annual decrease in emissions for 2015-2018. The RGGI implemented an auctioning system of allocation from the outset. This was likely made easier by the fact that the target at the time of the first auction, as stated above, was merely to cap emissions, so many businesses did not need to buy allowances as their emissions were not going to increase.<sup>111</sup> That said, at the first auction of allowances, held in September 2008,<sup>112</sup> demand for allowances exceeded supply by more than four to one.<sup>113</sup> The average price of an allowance was \$2.77.<sup>114</sup> The second auction, held in December 2008,<sup>115</sup> created a demand of 3.5 to 1, with the average price of allowances increasing to \$3.38.<sup>116</sup>

Procedurally the RGGI has taken a big step in ‘flawlessly’ administering<sup>117</sup> the world’s largest ever carbon auction<sup>118</sup> and, with regards emissions reduction, it seems very likely that the modest targets will be met, given that

<sup>103</sup> The States are Arizona and New Mexico.

<sup>104</sup> Pew Center on Global Climate Change *List of All State Initiatives* <<http://www.pewclimate.org/docUploads/AllStateInitiatives-01-27-09-a.pdf>> (28 February 2010).

<sup>105</sup> The participating states are Maine, New Hampshire, Vermont, Connecticut, New York, New Jersey, Delaware, Massachusetts, Maryland, Rhode Island. The RGGI also has five observers: Pennsylvania, District of Columbia, and the Canadian provinces of Québec, New Brunswick and Ontario.

<sup>106</sup> Regional Greenhouse Gas Initiative *Executive Summary* <[http://www.rggi.org/docs/RGGI\\_Executive\\_Summary.pdf](http://www.rggi.org/docs/RGGI_Executive_Summary.pdf)> (28 February 2010).

<sup>107</sup> *ibid.* The definition of ‘fossil fuel-fired’ varies depending on when a unit commences operation. A unit that commences operation on or after January 1, 2005 is considered fossil fuel-fired provided that fossil fuel comprises more than 5% of its total annual heat input. A unit that commenced operation prior to January 1, 2005 is considered to be fossil fuel-fired if fossil fuel comprises more than 50% of its total annual heat input.

<sup>108</sup> *ibid.*

<sup>109</sup> Regional Greenhouse Gas Initiative *Overview of RGGI CO<sub>2</sub> Budget Trading Program* <[http://www.rggi.org/docs/program\\_summary\\_10\\_07.pdf](http://www.rggi.org/docs/program_summary_10_07.pdf)> (28 February 2010).

<sup>110</sup> *ibid.*

<sup>111</sup> Regional Greenhouse Gas Initiative *Reports on First Auction*: ‘Prices were kept low, due in part to the high cap level set by the RGGI. The cap of 188 million tons per year was above pollution levels from last year, so only companies that are increasing emissions in the short term have high motivation to purchase permits.’

<sup>112</sup> Memorandum: Auction 1 Post Settlement Report Potomac Economics.

<sup>113</sup> *ibid.*

<sup>114</sup> *ibid.*

<sup>115</sup> Regional Greenhouse Gas Initiative *RGGI States’ CO<sub>2</sub> Auction Continues Strong Performance* <[http://www.rggi.org/docs/Auction\\_2\\_Release\\_Final\\_08\\_12\\_19c.pdf](http://www.rggi.org/docs/Auction_2_Release_Final_08_12_19c.pdf)> (28 February 2010).

<sup>116</sup> *ibid.*

<sup>117</sup> J Harvey quoted in ‘Designing and Implementing the First US Carbon Allowance Auction’ [2008] WorldEnergy.

[pre-compliance] auctions, combined with quarterly auctions to be held in the first compliance period,...will ensure an ample opportunity for bidders to obtain the [allowances] they will need for compliance across the entire 10-state region.<sup>119</sup>

This success may, paradoxically, also reveal a fundamental failure of the RGGI, which somewhat impacts its success as a scheme of emissions reduction – its unambitious reduction target and its under inclusiveness. If the targets are such that the auctions, while competitive, allow all participants to meet their needs, and at a low allowance cost, then there is little incentive to drastically reduce emissions. Furthermore, the RGGI only includes the power sector, whereas the IPCC's reports, as noted above, would suggest that a stabilisation of emissions across all sectors is desirable.<sup>120</sup> Despite this criticism, it is true that the RGGI, when contrasted with the lack of federal level regulation, is an important symbolic initiative, as well as one that will achieve some reductions in emissions and will likely set an example for other such initiatives and for the federal government.<sup>121</sup>

Aside from these achievements, the RGGI is set to provide further benefits through the participants' redistribution of the income received from allowance auctions. In a Memorandum of Understanding,<sup>122</sup> States have agreed to allocate a 25% minimum of allowances to support consumer benefit programs.<sup>123</sup> It is up to the individual States to decide how to allocate the remaining 75%, but the 'clear trend' is to dedicate all, or most, of the proceeds to support consumer benefits or strategic energy purposes. This redistribution 'leads to lowering of electricity demand, reducing the overall compliance costs of the RGGI program and its impact on electricity ratepayers.'<sup>124</sup>

## 2 The Midwestern Greenhouse Gas Accord ('MGGA')

The MGGA is an agreement to implement a cap and trade system, entered into by six States and one Canadian province.<sup>125</sup> The MGGA signatories agreed to 'establish targets for GHG emission reductions and time-frames' and complete development of '[a] proposed cap-and-trade agreement.'<sup>126</sup> The advisory group of the MGGA, charged with 'making

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<sup>118</sup> F Salmon 'Cap-and-Trade in the US' Portfolio <<http://www.portfolio.com/views/blogs/market-movers/2008/10/07/cap-and-trade-in-the-us/>> (28 February 2010).

<sup>119</sup> Regional Greenhouse Gas Initiative (n 115).

<sup>120</sup> IPCC *Climate Change 2007* (n 2).

<sup>121</sup> Regional Greenhouse Gas Initiative Executive Summary (n 106): 'Innovative aspects of RGGI design are already being incorporated into congressional cap-and-trade proposals and may influence the future direction of the EU ETS and other programs under development.'

<sup>122</sup> Memorandum of Understanding, 20 December 2005).

<sup>123</sup> *ibid.* Consumer benefit or strategic energy purposes include the use of the allowances to promote energy efficiency, to directly mitigate electricity ratepayer impacts, to promote renewable or non-carbon-emitting energy technologies, to stimulate or reward investment in the development of innovative carbon emissions abatement technologies with significant carbon reduction potential, and/or to fund administration of this Program.

<sup>124</sup> Regional Greenhouse Gas Initiative *Overview of RGGI CO2 Budget Trading Program* (n 109).

<sup>125</sup> The States are Minnesota, Wisconsin, Illinois, Iowa, Michigan, Kansas, and the Canadian Province of Manitoba. The MGGA also has three observers: Indiana, Ohio, and South Dakota.

<sup>126</sup> The Midwestern Greenhouse Reduction Accord 2007 <<http://www.midwesternaccord.org/news.html>> (3 March 2010).

recommendations for the establishment of targets [a and cap and trade scheme],<sup>127</sup> made its first preliminary recommendations in November 2008,<sup>128</sup> followed by updated recommendations in December 2008.<sup>129</sup> Applying these recommendations, the MGGA would require reductions of 15-25% below 2005<sup>130</sup> levels by 2020 and 60-80% by 2050.<sup>131</sup> The scoping subgroup, whose suggestions are included in the preliminary recommendations, 'recommends that the electric power sector, large industrial boilers and processes, transportation fuels, and landfills be included in the cap-and-trade program,'<sup>132</sup> as well as phasing in residential, and other emissions later on in the program.<sup>133, 134</sup>

A key observation of the MGGA<sup>135</sup> is that the 'government has the obligation to establish a policy framework for reducing emissions.' It further notes the importance of 'national leadership'.<sup>136</sup> Thus, as well as being a scheme that addresses emissions, the MGGA also attempts to act as an example. The MGGA acquires further significance for being the only regional agreement to include more than one US top-ten greenhouse gas emitter.<sup>137</sup> The advisory group for the MGGA recommended that the 'distribution of allowance value be limited to climate-related purposes,'<sup>138</sup> thus, hopefully, achieving similar benefits to those mentioned above.<sup>139</sup>

### 3 The Western Climate Initiative ('WCI')<sup>141</sup>

Much like the preceding two systems, the stated purpose of the WCI is to set an overall regional emissions goal and reduce emissions by developing 'a design for a regional market-based multi-sector mechanism, such as a [cap and trade] program.'<sup>142</sup> The WCI also seeks to promote 'development and use of clean and renewable energy,' increase energy efficiency and advocate 'regional and national climate policies that reflect the needs and interests of

<sup>127</sup> Preliminary Recommendations of the MGGA Advisory Group <[http://www.midwesternaccord.org/Meeting%20material%20pages/GHG-meeting-7/draft\\_rec\\_changes.pdf](http://www.midwesternaccord.org/Meeting%20material%20pages/GHG-meeting-7/draft_rec_changes.pdf)> (3 March 2010).

<sup>128</sup> *ibid.*

<sup>129</sup> *ibid.*

<sup>130</sup> *ibid.*

<sup>131</sup> *ibid.*

<sup>132</sup> Minnesota Climate Change Advisory Group (MCCAG) Cap and trade Recommendations Undated part of Scops Subgroup Conference Call Materials (6 February 2008).

<sup>133</sup> *ibid.*

*The MCCAG also recommends that the program include municipal waste incinerators, large confined animal feeding operations, and other large agricultural operations where it is practical to measure emissions beyond some de minimis level. The MCCAG favors the inclusion of fossil fuel for residential and commercial use..*

<sup>134</sup> 'The Advisory Group proposes to phase in heating fuels for residential, commercial and industrial buildings in the second three-year compliance period of the program.' Preliminary recommendations, *supra* (n132).

<sup>135</sup> Being the third order of business in the preamble, after the recognition of the effects of global warming and the acknowledgement that action should be taken.

<sup>136</sup> *ibid.*

<sup>137</sup> Damassa 'The Midwest Greenhouse Gas Accord by the Numbers' World Resources Institute <<http://www.wri.org/stories/2007/11/midwest-greenhouse-gas-accord-numbers>> (28 February 2010).

<sup>138</sup> 'Including: 1) accelerating transformational investment; 2) mitigating transitional adverse impacts of the program; and 3) addressing harmful impacts due to climate change.' Preliminary recommendations, *supra*

<sup>139</sup> Regional Greenhouse Gas Initiative Overview of RGGI CO2 Budget Trading Program (n 109).

<sup>140</sup> Greenberg 'Ontario to sign cap-and-trade climate plan' <<http://www.dose.ca/news/story.html?id=9ff531b5-1a6e-4864-8256-466a637b128f>> (28 February 2010).

<sup>141</sup> Western Regional Climate Action Initiative 2007.

<sup>142</sup> *ibid.*

western States.’<sup>143</sup> The agreement is between 11 States and four Canadian provinces,<sup>144</sup> making it the ‘largest cap and trade program in North America.’<sup>145</sup> The WCI set a goal of reducing emissions 15% below 2005 levels by 2020,<sup>146</sup> and has subsequently published design recommendations for its cap-and-trade system,<sup>147</sup> which will cover ‘nearly 90% of the region’s emissions.’<sup>148</sup>

The WCI is similar to the RGGI on the issue of the distribution of allowance proceeds; it requires a portion of income ‘will be dedicated to one or more [public purposes] expected to provide benefits region wide.’<sup>149</sup>

## E COMPARATIVE ANALYSIS

### 1 Federal Level Measures: Relative Efficacy to Date

As the federal level policies have been in place long enough for data on their impact to be available, it is possible to compare them in terms of actual emissions reductions, rather than just the relative strength of the targets and provisions they contain.

A brief glance at the respective approaches to climate change reveals that they are in stark contrast; the EU creating a Federal-level carbon market and regulatory scheme and the US implementing minimal and piecemeal regulation in favor of encouraging technological advancement and voluntary emissions reduction. Yet, neither the EU nor US schemes have been overwhelmingly successful. The EU scheme resulted in a 0.68% increase in emissions in 2006-2007,<sup>150</sup> compared to the US scheme, which resulted in a 1.4% increase over the same period.<sup>151</sup> When considered in terms of carbon intensity, the figures show decreases of 1.22%<sup>152</sup> and 0.6%<sup>153</sup> respectively. While these figures do not represent the level of emissions reductions suggested to be necessary by the IPCC,<sup>154</sup> they do show that the EU’s growth in

<sup>143</sup> *ibid.*

<sup>144</sup> The States include Arizona, California, Montana, New Mexico, Oregon, Utah, Washington, and the Canadian provinces of British Columbia, Manitoba, Ontario, and Quebec. The WCI also has 14 observers: Alaska, Colorado, Idaho, Kansas, Nevada, Wyoming, the Canadian province of Saskatchewan (which, along with Alberta, opposes a cap and trade system) and the Mexican states of Baja California, Chihuahua, Coahuila, Nuevo Leon, Sonora and Tamaulipas.

<sup>145</sup> Representing ‘approximately 73% of Canada’s economy [and] 20% of America’s economy.’ —‘Ontario Joins Largest North American Climate Collaborative’ Port of Entry <[http://www.portofentry.com/site/root/resources/industry\\_news/6740.html](http://www.portofentry.com/site/root/resources/industry_news/6740.html)> (28 February 2010).

<sup>146</sup> Western Climate Initiative *Statement of Regional Goal* <[http://azclimatechange.gov/download/082207\\_statement.pdf](http://azclimatechange.gov/download/082207_statement.pdf)> (28 February 2010).

<sup>147</sup> Western Climate Initiative *Design Recommendations for the WCI Regional Cap-and-Trade Program* <[http://www.pewclimate.org/docUploads/WCI%20Design%20Recommendations\\_23Sep%20complete\\_0.pdf](http://www.pewclimate.org/docUploads/WCI%20Design%20Recommendations_23Sep%20complete_0.pdf)> (28 February 2010).

<sup>148</sup> —‘US States, Canadian Provinces Announce Regional Cap-and-Trade Program to Reduce Greenhouse Gases’ Pew Center on Global Climate Change <[http://www.pewclimate.org/docUploads/Sept%2023%20PR\\_0.pdf](http://www.pewclimate.org/docUploads/Sept%2023%20PR_0.pdf)> (28 February 2010).

<sup>149</sup> Energy efficiency and renewable energy incentives and achievement, R&D (particular focus on carbon capture technologies), promotion of reductions from uncapped sources, adaption to climate change. Western Climate Initiative *Design Recommendations* (n 147).

<sup>150</sup> —‘Emissions trading: 2007 verified emissions from EU ETS businesses’ EUROPA <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/787>> (27 February 2010).

<sup>151</sup> US Department of Energy *Emissions of Greenhouse Gases in the United States 2007* (n 79).

<sup>152</sup> (n 150).

<sup>153</sup> US Department of Energy *Emissions of Greenhouse Gases in the United States 2007* (n 79).

<sup>154</sup> IPCC *Climate Change 2007: Synthesis Report*, Summary for Policymakers.

emissions was half that of the US in 2006-2007. Looking at a longer time frame, the EU appears to be on track to meet its Kyoto commitments; however, it has been observed that this slower emissions growth rate may not be down to the efficacy of the ETS itself, but to large 'one off' reductions which were to take place regardless – namely the UK's switch from coal to newly exploited natural gas, and the closure of inefficient East-German facilities following reunification.<sup>155,156</sup> This, as well as suggesting one factor contributing to the US's non-ratification of the Kyoto Protocol,<sup>157</sup> casts serious doubt on the efficacy of the EU ETS. By comparison, the US EIA estimates a steady increase in emissions under a business as usual scenario.<sup>158</sup>

Despite these minimal reductions in actual emissions, the relative efficacy of the systems may be seen differently in terms of future potential. The EU scheme has navigated uncharted territory and has had to be adapted and altered based on experience; the changes made to the ETS, as documented above, along with the promised unilateral 20% cut in emissions on 1990 levels by 2020 (30% if an international post-Kyoto agreement is reached),<sup>159</sup> seem to be indicative of the culmination of a 'coming of age' process. By contrast, the current US system does not appear to have great future prospects for emissions reductions unless it is changed.

It will also be obvious that other benefits can arise from these regimes that may not directly or contemporaneously reduce emissions. For instance, a regime that has failed to reduce emissions directly may at least show political will or leadership, or incentives to drive technological advancement may only become effective upon the arrival at some technological or scientific breakthrough that cannot yet be foreseen. The former is true of the EU's ETS; it would be unfair to dismiss the EU ETS, the first system of its kind in terms of form, scale and ambition, based on its negligible effect on emissions reductions, as it has been a strong showing of international leadership, in the face of attempts to stall action. The latter example is true of the US, though placing such faith in potential for future reductions, which are necessarily uncertain and unproven, may be dangerous given the urgency of the global warming situation. Acknowledging that technological advancement is best used as a supplementary measure, the EU has initiated a number of programs, similar to those of the US, to encourage technology and research, such as directives on carbon capture and storage<sup>160</sup> and strong research and development.<sup>161</sup>

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<[http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr\\_spm.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf)> (27 February 2010).

<sup>155</sup> Harrison and Sundstrom 'The Comparative Politics of Climate Change, Multi-Level Reinforcement: Explaining European Union Leadership in Climate Change Mitigation' (2007) 7(4) *Global Environmental Politics*.

<sup>156</sup> Schreurs and Tiberghien 'Multi-Level Reinforcement: Explaining European Union Leadership in Climate Change Mitigation' (2007) 7(4) *Global Environmental Politics*.

EU leadership was made possible in part because of changing underlying conditions in the three biggest polluter states (Germany, the UK, and Italy) that meant that even under business as usual scenarios there would be significant cuts in their emissions. It would not have been possible, however, without European Community-wide acceptance of the principle of differentiated obligation.

<sup>157</sup> Harrison and Sundstrom (n 155) note that the 'true' reductions targets of the Protocol, assessed by comparing the stated target to the projected business as usual scenarios, placed a far greater burden on the US, their real target in this sense being a 31% reduction, as opposed to the 7% stated reduction. The EU, by contrast, due to their already planned reductions, had a real target amounting to a reduction between 3-9%.

<sup>158</sup> US Department of Energy: Energy Information Administration *Annual Energy Outlook 2009 Early Release with Projections to 2030* <[http://www.eia.doe.gov/oiaf/aeo/pdf/0383\(2009\).pdf](http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2009).pdf)> (28 February 2010).

<sup>159</sup> *ibid.*

<sup>160</sup> COM (2008) 18, 2008/0015/COD Proposal For A Directive Of The European Parliament And Of The Council On The Geological Storage Of Carbon Dioxide And Amending Council Directives 85/337/EEC, 96/61/EC, Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC And Regulation (EC) No 1013/2006.

Commentators have suggested that the leadership of the EU is not genuine or sustainable.<sup>162</sup> A detailed discussion of this assertion is outside the scope of this paper and merely makes for an interesting political sidenote; whether or not it is true, it does not detract from what is, arguably, the most significant achievement of the ETS: its role as an experiment and a model of how such a cap and trade system can work. By starting the ETS and reviewing its effectiveness, the EU has offered the international community an invaluable source of information and ideas. This can be seen, for example, in the preamble to the MGGA, where the ETS is cited as a working instance of a trading scheme. In addition to setting an example to others, with the knowledge the EU has acquired, it has been able to make its own assessments of the system and make changes to it. As noted earlier, these changes now seem to be approaching a ‘critical mass’, whereby inefficiencies and bars to efficacy are lifted and the ETS becomes a powerful mechanism for emissions reduction scheme.

Notwithstanding the damning indictment of the US approach, there is certainly some truth in the assertion that, whatever the intention of the US federal government, the laissez-faire approach has ultimately been successful. This is so in that it has led to initiatives at the state and regional levels, such as the creation of small, manageable cap and trade systems, and greater experimentation with possible measures, such as the varying provisions of the regional agreements (whereas the EU is limited in the extent it can experiment by only having one system with which to experiment). In the words of the Governor of Maine: ‘in the absence of any [federal] leadership... states must continue to be the laboratories for policy implementation.’<sup>163</sup> Though this statement, while supporting the above proposition, itself acknowledges that these ‘laboratories’ are only necessary in the case of federal inaction, an opinion shared by others.<sup>164</sup> In addition, while the States taking part in the RGGI, MGGA and the WCI collectively account for 37% of US emissions (10%, 14% and 13% respectively), it is likely that some States will not be moved to act by a lack of federal intervention.<sup>165</sup> The number and variety of calls for a federal policy would seem to suggest that the national and international community believes that there are benefits to be gained from implementing a federal scheme which are greater than those gained from the present system of experimentation. Such calls have come from all directions and actors, including Governors of States involved in regional agreements,<sup>166</sup> think tanks,<sup>167</sup> influential foreign figures,<sup>168</sup> NGOs<sup>169</sup> and the EU.<sup>170</sup>

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<sup>161</sup> For example the Institute for Prospective Technological Studies, part of the European Commission's Joint Research Centre, conducts a considerable amount of research into climate change related technologies <<http://ipts.jrc.ec.europa.eu/activities/>> (28 February 2010), and the Johannesburg Renewable Energy Coalition, which eponymously focuses on research into renewable energy technologies. For the EU's research and development strategy generally, see European Commission *EU action against climate change: Research and development to fight climate change* <[http://ec.europa.eu/environment/climat/pdf/brochures/research\\_en.pdf](http://ec.europa.eu/environment/climat/pdf/brochures/research_en.pdf)> (28 February 2010).

<sup>162</sup> Schreurs and Tiberghien (n 156).

<sup>163</sup> However he notes that the RGGI, on which he was commenting, ‘can serve as a model for a 50-state federal cap-and-trade system.’ Baldacci ‘Comments on the Regional Greenhouse Gas Initiative’ <[http://www.rggi.org/docs/Comments\\_on\\_the\\_Regional\\_Greenhouse\\_Gas\\_Initiative\\_2\\_.pdf](http://www.rggi.org/docs/Comments_on_the_Regional_Greenhouse_Gas_Initiative_2_.pdf)> (28 February 2010).

<sup>164</sup> Governor Jim Doyle of Wisconsin stated, when referring to the WCI, ‘in the absence of strong federal climate change policy, Wisconsin and many other states have led by example.’ Vigue ‘Governor Doyle, Fellow Governors Offer Climate Change Partnership with President Obama’ Office of the Governor Jim Doyle <[http://www.wisgov.state.wi.us/journal\\_media\\_detail.asp?locid=19&prid=3926](http://www.wisgov.state.wi.us/journal_media_detail.asp?locid=19&prid=3926)> (1 March 2010).

<sup>165</sup> Coal-centric states, such as Pennsylvania, who chose only to be an observer to the RGGI, rather than make solid emissions reduction commitments.

<sup>166</sup> See Baldacci (n 163) and Doyle (n 164).



Overall then, it seems fair to conclude that the EU approach has proven to be more effective, if not at reducing emissions in real terms, at least in the production of indirect and supplementary benefits such as leadership and example-setting, and has better prospects for success in the future.

## 2 The EU ETS and US Regional Cap and Trade systems: Evaluation and Comparison

Given that only one of the three regional initiatives (RGGI) is currently operational (and only recently so), there is not yet sufficient data available to enable a determination of whether these systems are effective. Also, given the significant changes due to be made to the EU ETS, as discussed above, a comparison to the US regional schemes (whose design has had the advantage of hindsight, partly by looking to the failures of the ETS) based on its results to date is likely to do it a disservice and paint an unrealistically bleak picture of its prospects.

In the absence of clear, long-term data, an evaluation and comparison of system designs is necessary to assess the potential for, and likelihood of, emissions reductions. A number of factors must be addressed in evaluation; some of these are found in the agreements discussed, such as the respective program's coverage and scope, use of offsets, allowance allocation and revenues. Aldy and Pizer<sup>171,172</sup> suggest further key policy consideration: mechanisms to address competitiveness concerns and complementary research and development policies. The Sierra Club, and a number of other organisations,<sup>173</sup> advocates the discussion of similar design elements,<sup>174</sup> including the cap itself and linkage provisions. Using these considerations, individual evaluations and a comparative analysis can be made as between the four cap and trade systems documented in this paper.

## F TARGETS

The target of a system is obviously crucial; an insufficiently low target will not produce sufficient reductions, whereas an overly ambitious target may set the system up to fail.

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<sup>167</sup> For example McCrea and Kendall who state '[t]here can be little doubt that the US needs a strong carbon-pricing system, such as a cap-and-trade program, to help combat global warming.' Grist <<http://www.grist.org/article/Part-I-President-Obamas-roadmap-to-cap-and-trade/>> (1 March 2010). Another example is the Constitutional Accountability Center, guest-writing for Grist.org <<http://gristmill.grist.org/story/2009/1/29/231324/472/>> (1 March 2010).

<sup>168</sup> 'A US cap and trade program is both possible and beneficial.' Tony Blair quoted in Baldacci (n 163).

<sup>169</sup> A cap and trade program is 'the kind of smart energy plan that the [US] needs.' Frances Beinecke quoted in Baldacci (n 163).

<sup>170</sup> Traynor 'EU calls on America to create transatlantic carbon trading scheme' *The Guardian* (London 28 January 2009) <<http://www.guardian.co.uk/environment/2009/jan/28/carbon-trading-us-europe>> (1 March 2010).

<sup>171</sup> Aldy and Pizer Resources for the Future Discussion Paper 08-20 *Issues in Designing US Climate Change Policy* <<http://www.rff.org/documents/RFF-DP-08-20.pdf>> (1 March 2010).

<sup>172</sup> Though Aldy and Pizer's, *ibid*, discussion paper eponymously refers to US domestic policy, there is nothing to suggest that their questions and suggestions for analysing the design of cap and trade systems cannot apply to such systems generally; though some details of their analysis may be confined to US domestic policy.

<sup>173</sup> California Interfaith, Energy Independence Now, the Pacific Forest Trust, Californians Against Waste, Environment California, Union of Concerned Scientists, Coalition for Clean Air and the Natural Resources Defence Council.

<sup>174</sup> Sierra Club California Cap and Auction Design Position Paper <<http://www.sierraclubcalifornia.org/Cap%20and%20Auction%20Design%20Position%20Paper%202025%20081.pdf>> (1 March 2010).

Comparing the targets directly in terms of total emissions reduction is a difficult task due to the differing baseline years and scopes of the schemes. The EU ETS aims to cut total emissions 14% by 2020, assessed against a 2005 baseline.<sup>175</sup> The WCI also uses a 2005 baseline and aims for a cut of 15% by 2020. The MGGA similarly aims for a 15-25% reduction on 2005 levels by 2020. The RGGI, while offering an 18% reduction of power-sector emissions by 2018, only offers a forecasted target of a 2.33% reduction in total emissions by 2020 when adjusted to a 2005 baseline. This is because it only regulates electricity generation<sup>176</sup> and sets its baseline at a later year (2009)<sup>177</sup> than the other schemes. A further factor in comparing these targets arises from the envisaged effects of supplementary measures. The EU, for example, also has a direct R&D policy, the only such policy among the schemes. The RGGI, as a power-sector-centric system does not mention supplementary policy.

The EU ETS, MGGA and WCI have similar targets, though the possibility that the ETS and MGGA targets will increase makes them stronger. The RGGI, while seen to have been innovative in terms of procedure, provides a target so low as to be virtually ineffectual when viewed in terms of total emissions reductions.

The coverage and scope of the schemes may also affect the perceived strength of the targets. Where the cap-and-trade scheme covers the whole of the economy, reductions are cheaper as the costs of making them can be spread across more sources.<sup>178</sup> Thus the target of an all-encompassing scheme could reasonably be expected to be made stronger. Whereas the ETS, MGGA and WCI include supplementary reductions in the target, the RGGI while only making a tiny contribution to overall emissions reductions, makes an 18% reduction in the emissions of very narrow range of emitters. Viewed in this light, the target looks less weak.

## G PROGRAM COVERAGE AND SCOPE

As a general design principle, the Union of Concerned Scientists<sup>179</sup> believes that 'it is simpler, faster, and ultimately more efficient to include all major emitting sectors' and that 'extending a hard cap over a larger part of [the] economy increases the likelihood of achieving economy-wide reduction targets.'<sup>180</sup> In this regard, the MGGA and the WCI have made the best commitments. The EU takes the 'middle road' and the RGGI has the narrowest scope of the schemes discussed; only covering about 25% of the region's total emissions.

Aldy & Pizer suggest that it is best to include as wide a range of sources as possible from the outset as attempts to include further sources later on are likely to be met with resistance. It seems likely that the particularly narrow scope of the RGGI may cause difficulties in expansion as other industries can make the argument that the RGGI was never intended for such expansion, whereas the other agreements are framed as general cap and trade systems that are to evolve and expand. There is a further, perhaps unforeseen, conflict

<sup>175</sup> MEMO/08/35, Questions and Answers on the Commission's proposal to revise the EU Emissions Trading System.

<sup>176</sup> MGGA (n 127).

<sup>177</sup> *ibid.*

<sup>178</sup> Union of Concerned Scientists *Comments of the Union of Concerned Scientists to the Midwestern Greenhouse Gas Reduction Accord Advisory Group* <<http://www.midwesternaccord.org/Comments/Union%20of%20Concerned%20Scientists.pdf>> (1 March 2010) – a wide scope 'allow[s] market forces to help determine which sectors can provide the cheapest emission reductions' – and Aldy & Pizer (n 171) – 'economic theory recommends making a cap-and-trade program as broad as possible in order to seek out the cheapest abatement opportunities.

<sup>179</sup> Union of Concerned Scientists (n 178).

<sup>180</sup> *ibid.*

arising from this under-inclusiveness: a lawsuit<sup>181</sup> has been filed by one power company, complaining that the limited scope of RGGI means that the 'regulations arbitrarily discriminate against a few' emitters and 'levies a [tax] on electric generators.'<sup>182</sup>

This observation does not appear to apply so strongly to EU measures; for instance, the EU ETS is successfully being expanded to include further industrial activities<sup>183</sup> and aviation<sup>184</sup> (which is particularly significant as aviation is an area known for its resistance to regulation<sup>185</sup> and its lobbying power).<sup>186</sup> The fact that the EU overcame such resistance from the aviation lobby may also suggest that it is not the advent of resistance itself that is important, but the strength of political will to overcome it. In this regard, the political intricacies of the US may mean it is essential for a US cap and trade scheme to be inclusive from the beginning, whereas the EU can tolerate a little more flexibility.

In the US, the propensity for strong resistance goes beyond a mere reaction to expansion of existing systems, and seems to permeate every stage of cap and trade implementation.<sup>187</sup> For example, the WCI received strong comments regarding the inclusion of aviation in the initiative, asserting that its inclusion would be unbeneficial and, moreover, illegal.<sup>188</sup> Similar opposition came from the gas,<sup>189</sup> oil,<sup>190</sup> and cement<sup>191</sup> industries.<sup>192</sup>

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<sup>181</sup> The suit 'challenges the legal authority of New York's agencies to create the cap-and-trade system' - it should be noted that the possibility of bringing this suit may be unique to New York, as it is the only state to implement the RGGI through executive, and not legislative, action. Kate Galbraith 'Lawsuit Filed in Northeast Carbon Trading Scheme' New York Times (New York 29 January 2009).

<sup>182</sup> *ibid.*

<sup>183</sup> For example aluminum and ammonia production. COM(2008) (n 49).

<sup>184</sup> *ibid.*

<sup>185</sup> In the present case, the inclusion of aviation was 'bitterly opposed by the airline industry.' — 'Airlines Prepare for EU Carbon Trading Scheme' EurActiv <<http://www.euractiv.com/en/transport/airlines-prepare-eu-carbon-trading-scheme/article-179059>> (1 March 2010).

<sup>186</sup> For an extreme example of the power of the aviation lobby in the UK, see Toby Helm 'Fury at airport lobby links to No 10' The Observer (18 January 2009), reporting on the close ties between the British Government and the aviation industry. In the US, air transport companies spent \$90,961,831 on lobbying in 2008. The Center for Responsible Politics <<http://www.opensecrets.org/lobby/indusclint.php?lname=M01&year=a>> (1 March 2010).

<sup>187</sup> For a particularly strong opposition, Kaminsky who states that 'cap-and-trade, when it arrives, will either be as damaging as possible to consumers, will accomplish none of its stated goals, or, most likely, both.' R Kaminsky 'Potential Costs to America From Cap-and-Trade' Human Events <<http://www.humanevents.com/article.php?id=26621>> (1 March 2010).

<sup>188</sup> Air Transport Association *Comments on Western Climate Initiative Draft Program Scope Recommendations* and Air Transport Association *Comments on Western Climate Initiative Draft Design Recommendations on Elements of the Cap-and-Trade Program* (n 147).

<sup>189</sup> See American Gas Association *Comments of the American Gas Association on WCI Draft Recommendations* <<https://www.aga.org/NR/rdonlyres/6C7BC6EE-D8A1-407F-9CCA-36D0767DAA60/0/0806WCIFINALCOMMENTS.pdf>> (1 March 2010) — 'AGA urges WCI to cover residential and commercial natural gas customers through enhanced energy efficiency programs rather than by including them under an emissions cap-and-trade system at this time.' Also see Carbon Offset Providers Coalition *RE: Comments on WCI Draft Recommendations* — 'we oppose the inclusion of residential and commercial natural gas customers in a cap-and trade system.' However, some gas companies were not entirely opposed to inclusion: see Avista *Joint Comments to the WCI on its Draft Recommendations on Elements of the Cap-And-Trade Program* <<http://www.aga.org/NR/rdonlyres/C9CEFD67-E8C3-4058-90BA-04283F904ADC/0/0805WCISCOPENJCOMMENTS.pdf>> (1 March 2010) — 'We recommend bringing large customers into a regional cap and trade market, but do not support bringing small natural gas customers ([commercial and residential]) into that same cap and trade market at this time.'

<sup>190</sup> In a letter to Ms Janice Adair, Chairman of the Western Climate Initiative, Marty Bitter, Manager of State Government Affairs of Chevron Corporation stated: '[I]t is the wrong time to take the unprecedented action to combine transportation fuels in a cap-and-trade program.' <[http://www.westernclimateinitiative.org/Draft\\_Proposals\\_Comments.cfm](http://www.westernclimateinitiative.org/Draft_Proposals_Comments.cfm)> (1 March 2010).

## H      OFFSETS<sup>193</sup>

A general consensus that offsets are a desirable element of a cap and trade system may be inferred from their inclusion in all of the discussed regimes. Offsetting can be used to counter-balance emissions that are impossible to reduce (for instance, cement production emissions),<sup>194</sup> or those that are not covered by the cap and trade system. It can also reduce the cost of compliance, offsetting emissions that are covered, but costly to reduce, by making cheaper reductions elsewhere. While useful, it is submitted that there are a number of potential issues with offsets that schemes must work hard to address: the reductions may not be ‘real’ – the reduction may ‘not represent a truly additional effort to mitigate emissions’<sup>195</sup> or it may have taken place anyway – or their extent may be difficult to measure; true changes in behavior may be discouraged<sup>196</sup> and the secondary benefits of the reduction – for example, better immediate air quality – will not be felt locally. In addition, transaction costs may be so high as to make the cost-saving effect of the offset minimal.<sup>197</sup> In order to ensure the integrity of offsets, the Sierra Club suggests that they must be ‘real, quantifiable, additional, permanent, subject to independent third-party verification and enforceable.’<sup>198</sup> These may serve as principles, or guidelines, for assessing offset provisions. In addition, they need to ensure changes in behavior indicates that offsets should only represent a limited portion of the compliance obligation, be discounted where appropriate to compensate for loss of local benefits and uncertainty, and aim to minimize transaction costs.

Offsets under the EU ETS are obtained through the use of two of the Kyoto flexibility mechanisms:<sup>199</sup> joint implementation<sup>200</sup> and the clean development mechanism.<sup>201</sup> The

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<sup>191</sup> *Comments on Draft Design Recommendations*, Ash Grove Cement Company, 06/06/2008, suggesting that some emissions in this industry ‘cannot be impacted whatsoever by efficiency or other improvements in the process’ and thus ‘strongly oppos[ing] the inclusion of [such emissions].’ Available at: <[http://www.westernclimateinitiative.org/Draft\\_Proposals\\_Comments.cfm](http://www.westernclimateinitiative.org/Draft_Proposals_Comments.cfm)> (1 March 2010)

<sup>192</sup> These industries ‘believe their situation warrants special consideration—competition from abroad, vulnerability to price volatility, or security.’ Aldy & Pizer (n 171).

<sup>193</sup> ‘The theory is simple: projects that reduce emissions are granted credits equal to the volume of reductions... Firms regulated by the cap-and-trade program [use the credits] to offset some of their emissions.’ *ibid*.

<sup>194</sup> *Comments on Draft Design Recommendations* (n 191).

<sup>195</sup> Aldy & Pizer (n 171). As an example, they refer to the contention that the CDM of the Kyoto Protocol has mostly been used to destroy HFC-23 creating a subsidy to open factories for this purpose. New Scientist noted that ‘it is very wasteful to use the CDM to ensure destruction of HFC 23, when it would be far cheaper to simply give the factories the money to install the equipment to destroy the gas.’ — ‘Kyoto Protocol ‘loophole’ has cost \$6 billion’ New Scientist <<http://www.newscientist.com/article/dn11155-kyoto-protocol-loophole-has-cost-6-billion.html>> (1 March 2010).

<sup>196</sup> ‘[T]he danger is that [offset projects] will distract attention from the broader effort to curb global warming gases, and that the lure of quick profit will encourage short-term fixes at the expense of fundamental, long-run solutions.’ Bradsher ‘Outsize Profits, and Questions, in Effort to Cut Warming Gases’ The New York Times (New York 21 December 2006) <<http://www.nytimes.com/2006/12/21/business/21pollute.html>> (1 March 2010). George Monbiot states: ‘Any scheme that persuades us we can carry on polluting delays the point at which we grasp the nettle of climate change and accept that our lives have to change. [Offsetting] undermin[es] the necessary political battle to tackle climate change at home.’ Monbiot ‘The trade in carbon offsets is an excuse for business as usual’ The Guardian (London 18 October 2006).

<sup>197</sup> ‘The US experience with project-based trading shows that high transaction costs can eliminate most of the potential cost-savings of trading.’ Aldy & Pizer (n 171).

<sup>198</sup> Sierra Club California *Cap and Auction Design Position Paper* (n 174) parenthesis omitted.

<sup>199</sup> Kyoto Protocol (n 14) Articles 6 and 12.

<sup>200</sup> ‘[C]overing projects carried out in countries with an emissions reduction target under the Protocol’ MEMO/08/35 Questions and Answers on the Commission’s proposal to revise the EU Emissions Trading System.

<sup>201</sup> ‘For projects undertaken in developing countries.’ *ibid*.

prolific rulemaking pertaining to these offsetting mechanisms<sup>202</sup> warrants a discussion paper in itself. Here, it suffices to merely take a cursory glance at these rules and instead focus instead on an assessment of how positive a contribution offsetting has made to the ETS. With regard to the CDM, in order to ensure that emissions reductions are ‘real, measurable, and [offer] long-term benefits related to the mitigation of climate change’ and that they are ‘additional to any that would occur in the absence of the certified project activity.’<sup>203</sup> The Conference of the Parties<sup>204</sup> has provided for verification and monitoring to ensure that the criteria of Article 12 are met. Similar provisions exist for joint implementation.<sup>205, 206</sup>

As the majority of JI and CDM projects are implemented by EU Member States,<sup>207, 208</sup> it will be obvious that any criticism or praise levelled at the mechanisms generally will be of particular significance to the ETS. A look at the numbers suggests that the mechanisms are functional and their use is growing. By 2012 it is estimated that there will be 515 JI<sup>209</sup> and more than 4200 CDM<sup>210</sup> projects, accounting jointly for a reduction of more than 2.9 billion MtCO<sub>2</sub>e,<sup>211</sup> much of which, as noted, will have come from the EU.

One early criticism of the CDM was the ‘perverse incentives’ argument relating to HFC-23,<sup>212</sup> which has now been partly addressed by governments,<sup>213</sup> and partially addressed by a UN COP decision, which ‘encourages parties... to provide funding from sources other than the clean development mechanism for the destruction of HFC-23.’<sup>214, 215</sup> A more present major criticism is that, while the bare statistics suggest success, in reality additionality is lacking, to the point that ‘much of the current CDM market does not reflect actual reductions in emissions.’<sup>216</sup> A further investigation of the statistics does seem to bolster this criticism:

<sup>202</sup> For joint implementation rules, see the JI website <<http://ji.unfccc.int/Ref/Docs.html>> (2 March 2010). For CDM rules see the CDM rulebook <<http://www.cdmrulebook.org>> (1 March 2010).

<sup>203</sup> Kyoto Protocol (n 14) Article 12.

<sup>204</sup> Conference of the Parties to the United Nations Framework Convention on Climate Change, serving as the Meeting of the Parties to the Kyoto Protocol.

<sup>205</sup> Note that the potential for spurious emissions reductions of JI projects has been less of a concern than with CDM projects, as JI occurs in countries which have an emission reduction requirement.

<sup>206</sup> As a starting point, see Report of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol on its first session: *Decision 9/CMP.1 Guidelines for the implementation of Article 6 of the Kyoto Protocol*.

<sup>207</sup> For statistics on JI, see United Nations Environment Program Division of Technology Industry and Economy *Session 5: Kyoto and Joint Implementation, Applying Cleaner Production to Multilateral Environmental Agreements: A Training Kit* <<http://www.unepie.org/scp/publications/details.asp?id=DTI/0899/PA>> (2 March 2010).

<sup>208</sup> ‘Buyers based in Europe (41% in 2004, 56% in 2005) and Japan (36% versus 38%) dominate the market for project-based transactions.’ *ibid* Session 6.

<sup>209</sup> *ibid*.

<sup>210</sup> *ibid*.

<sup>211</sup> JI: 268 MtCO<sub>2</sub>e (*Kyoto and Joint Implementation* (n 207)). CDM: > 2,900,000,000 CERs. One CER is ‘equal to one metric tonne of carbon dioxide equivalent’ <<http://cdm.unfccc.int/Statistics/index.html>> (2 March 2010).

<sup>212</sup> Aldy & Pizer (n 171).

<sup>213</sup> ‘[A]wareness of the HFC-23 problem has grown and governments have tried to clamp down on these projects.’ Wara and Victor Program on Energy and Sustainable Development Working Paper *A Realistic Policy on International Carbon Offsets* <[http://iis-db.stanford.edu/pubs/22157/WP74\\_final\\_final.pdf](http://iis-db.stanford.edu/pubs/22157/WP74_final_final.pdf)> (2 March 2010).

<sup>214</sup> Only partially because the decision does not mandate that the CDM not be used. The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol *Decision 8/CMP.1: Implications of the establishment of new Hydrochlorofluorocarbon-22 facilities seeking to obtain certified emission reductions for the destruction of hydrofluorocarbon-23* <<http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=100>> (2 March 2010).

<sup>215</sup> *ibid*.

<sup>216</sup> Wara & Victor (n 213).

‘almost three-quarters of projects were already complete at the time of approval.’<sup>217</sup> Assessing whether the reality is as disappointing as the criticism suggests is itself difficult. On the one hand there are strict rules and requirements to ensure additionality. However, critics suggest that, in practice, ‘judging additionality has turned out to be unknowable and unworkable.’<sup>218</sup>

Overall it seems impossible to know with any degree of certainty how effective the EU offsetting regime has been. While the experience, at best, suggests a need for great caution, it may also suggest that offsets should not be used at all,<sup>219</sup> or that they should not be used to meet the compliance target, but be encouraged for the secondary benefits.<sup>220</sup>

All three of the US regional agreements have adopted almost this exact wording of the Sierra Club when referring to the criteria that should apply to offsets. However, given the difficulty experienced by the EU in ensuring these criteria are met, even where extensive regulations exist, it is hard to think that anything short of a revolutionary new method of implementing offsets would be sufficient to achieve the real reductions needed for offsets to be a valuable part of an emissions trading scheme. It may be said that the failure lies with the CDM specifically, rather than offsets generally, but this overlooks the fact that the key problem with the CDM is verifiability; it is obvious that this problem can apply to any system that requires emissions to be measured. In this regard, Wara & Victor ‘counsel against many of the popular “solutions” to problems with offsets’ when designing US policy, including even the imposition of restrictions on their use.<sup>221</sup>

Taking this stern warning into account, it is concerning that the WCI allows a huge 49% of total compliance to be met by offsets, and the RGGI allows 3.3%, with the possibility of an increase.<sup>222</sup> The MGGA notes that use of offsets should be constrained, but is not yet specific.<sup>223</sup> Worryingly, the MGGA and the WCI also envisage the use of the CDM and JI.<sup>224</sup> While limitation on use does not solve the problems with offsets, it is still an important consideration. Offsets, on their face, have an attractive appeal and are, in theory, a legitimate and useful method of reducing emissions. Imposing a limit on their use allows a system to take advantage of the political and theoretical appeal of offsets, and attempt to develop a reliable mechanism, while also offering some measure of ‘damage limitation’ – for example, if offsets prove to be impossibly unworkable, a system limiting their use to 3.3% of a compliance obligation will be less disrupted than a system only limiting to 49%.

## I REVENUES AND ALLOWANCE ALLOCATION

<sup>217</sup> The fact that projects were already completed clearly suggests that capital was not needed, and that the reductions had already taken place. *ibid.*

<sup>218</sup> McCully ‘Kyoto Carbon Trading Strategy Discredited’ *The Guardian* (London 21 May 2008).

<sup>219</sup> McCully, *ibid.*, goes as far as saying that ‘we cannot risk one of [climate policy’s] central planks being a programme that is so fundamentally flawed. In the short term, the CDM must be radically reformed. In the long term it must be replaced.’

<sup>220</sup> Further reduction in emissions beyond the stated target. Note that the CDM is also intended to aid third world countries; a ‘secondary’ benefit to that of meeting the compliance targets.

<sup>221</sup> ‘Offset caps as envisioned in the Lieberman-Warner draft legislation, for example, do little to fix the underlying problem of poor quality emission offsets.’ Wara & Victor (n 213).

<sup>222</sup> *ibid.*

<sup>223</sup> ‘The use of offsets should be constrained to provide for reductions from the covered sectors. The specific constraint on offsets use will be determined after review of the modelling results.’ MGGA *Draft Recommendations* (n 128).

<sup>224</sup> ‘States and provinces should consider incorporating the Clean Development Mechanism (CDM) and Joint Implementation (JI) programs.’ WCI *Draft Recommendations*.

The issue of revenues made through cap and trade systems and the allocation of allowances is ‘one of the most formidable questions.’<sup>225</sup> The EU has proposed an increased level of auctioning following the experience with the NAP system. Under these proposals, electricity generation allowances will be fully auctioned from 2013; other sectors will approach full auctioning gradually, starting at a level of 20% and arriving at 100% auctioning in 2020.<sup>226,227</sup> The EU has also suggested that a portion of revenue be dedicated to mitigation and adaption, with 20% being proposed.<sup>228</sup> As previously noted, the RGGI has had some success with its auctioning system, and has led to an agreement to use at least 25% of revenues for climate change related purposes.<sup>229</sup> The MGGA draft recommendations note that the ‘decision on whether to auction or allocate allowances resides ultimately with the jurisdictions,’ but does place conditions on free allocation<sup>230</sup> and auctions. The WCI design recommendations would require a portion of revenues be allocated for climate change related purposes also.

There are significant benefits to using auctions. The vast revenues generated could be used in a variety of ways. Most importantly, from the environmental perspective, they could be used to increase the effectiveness of climate change abatement by funding further measures, as is the case in all of the above systems. From a different point of view, it is submitted that the revenue could allow a reduction of other taxes. This would certainly help overcome some of the political problems with climate regulation. Revenues may further be used to overcome the ‘regressivity’ of climate change policy.<sup>231</sup>

## J ADDRESSING COMPETITIVENESS CONCERNS

The imposition of a fee for emissions historically released at no cost may reduce competitiveness of regulated entities with similar entities internationally, or inter-state. While this is, taken at face value, a concern of considerable weight, closer inspection somewhat lessens its importance. Competition with other developed nations is unlikely to be affected as all nations of the OECD have comparable environmental regulation<sup>232</sup> and some analyses<sup>233</sup> suggest that only the most energy intensive industries ‘face any kind of economically and statistically meaningful competitiveness threats.’<sup>234</sup>

<sup>225</sup> Aldy & Pizer (n 171).

<sup>226</sup> COM(2008) 16 final 2008/0013 (COD) Proposal for a DIRECTIVE amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading system of the Community.

<sup>227</sup> ‘[I]t is estimated that, at least two thirds of the total quantity of allowances will be auctioned in 2013.’ *ibid.*

<sup>228</sup> *ibid.*

a certain percentage of the proceeds from the auctioning of allowances should be used to reduce greenhouse gas emissions, adapt to the impacts of climate change, fund research and development, develop renewable energies, for the capture and geological storage of greenhouse gases, to contribute to the Global Energy Efficiency and Renewable Energy Fund, for measures to avoid deforestation and facilitate adaptation in developing countries, and for addressing social aspects such as possible increases in electricity prices in lower and middle incomes.

<sup>229</sup> *ibid.*

<sup>230</sup> For example, receipt of free allowances must be contingent upon the implementation of energy efficiency programs and upon historical emissions.

<sup>231</sup> Metcalf *Distributional Considerations with Carbon Pricing* (Director’s Conference On Climate Change 16 November 2007) <<http://www.cbo.gov/communications/advisory/2007-11-16-climatechange/metcalf.pdf>> (2 March 2010)

<sup>232</sup> Ederington Minier and Levinson ‘Footloose and Pollution-Free’ (2005) 87(1) *Review of Economics and Statistics*.

<sup>233</sup> Morgenstern Aldy Ho and Pizer Resources for the Future: *Competitiveness Impacts of Carbon Dioxide Pricing Policies*, in *Assessing US Climate Policy Options*.

<sup>234</sup> Aldy & Pizer (n 171).

Some concerns remain, and Aldy and Pizer suggest that ‘coordinating policy efforts with other countries, using allowance allocations and/or exemptions as means to mitigate adverse impacts on industry, and regulations or taxes on imports’ could address these concerns.

The EU uses the first technique; the cost of doing business is the same in any of the 27 countries. It may be that the three regional agreements of the US have the opposite effect; it could be cheaper for a business to operate in a different state, where the price per ton of carbon is less, or there is no regulation (‘the Delaware effect’ or ‘race to the bottom’). Some research speculates, however, that despite originating in different systems, the price of carbon begins to converge over time, thus reducing the competitive burden.<sup>235</sup>

While the EU began with free allowances, it will now join the other regional agreements in using auctions. Free allowances do address the competitiveness concern. However, the revenue to be gained from auctioning are clearly extremely valuable, and appear to have outweighed the minimal concern over competitiveness. It may be observed that the traditional dichotomy of choosing either auctions or free allocation has now been blurred and, although it seems to remain with the four agreements discussed, future cap and trade systems may choose to allocate allowances freely to industries that are most likely to suffer adverse effects.

The discussed systems do not mention taxes of the kind envisaged here; it is likely that such adjustments will be left to the federal government to make as necessary.

Much evidence suggests that the most desirable, and possibly necessary,<sup>236</sup> step that should be taken to reduce competitiveness effects is to have a global system of carbon trading, or many regional systems that link together.<sup>237</sup> This would mean that the burden is on businesses and entities everywhere, so that the competitiveness of one particular country, state, or business, is not affected appreciably more than another. Senator Barbara Boxer, a proponent of cap and trade systems, affirms this notion in her Principles for Designing Global Warming Legislation, saying that legislation should ‘ensure a level global playing field, by providing incentives for emission reductions and effective deterrents so that countries contribute their fair share.’<sup>238</sup> From this viewpoint, the issues of linking of systems, discussed at the end of this section, and future international agreement take on additional importance.

## K COMPLEMENTARY R&D POLICIES

R&D is important to climate change abatement and adaption in a similar way to the distribution of allowance revenues; it supplements the primary goal of a physical reduction in emissions. By researching and developing new technologies, the level and/or pace of reduction and adaption can be bettered, and/or the costs of compliance may overall be reduced. While some innovation can be expected as a result of the increased costs of business due to a cap and trade system, incentives for investment may still be weak because of the nature of the research; ‘creating knowledge through R&D generates benefits that the

<sup>235</sup> Aldy ‘Divergence in State-Level Per Capita Carbon Dioxide Emissions’ (2007) 83(3) Land Economics.

<sup>236</sup> A global agreement is ‘a necessary step toward equalizing costs to different countries.’ Harrison and Sundstrom ‘The Comparative Politics of Climate Change’ (2007) 7(4) Global Environmental Politics.

<sup>237</sup> ‘Global implementation... would reduce the competitiveness effects of a national-level policy.’ Morgenstern et al *Issue Brief : Competitiveness Impacts of Carbon Dioxide Pricing Policies on Manufacturing* <[http://www.rff.org/rff/Publications/upload/31811\\_1.pdf](http://www.rff.org/rff/Publications/upload/31811_1.pdf)> (3 March 2010).

<sup>238</sup> Boxer *Principles for Designing Global Warming Legislation* <[http://epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore\\_id=14dc734d-74c9-4fb3-8bf2-6d5d539226d1](http://epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=14dc734d-74c9-4fb3-8bf2-6d5d539226d1)> (2 March 2010).



innovator cannot fully appropriate.’<sup>239</sup> Furthermore, there is a need for governmental intervention as many projects that need to be undertaken are too high-risk, and are therefore unlikely to be taken on by private investors.<sup>240</sup> In order to fill this gap, it is clear that a federal level policy is needed.

The US R&D policy, as noted, is not supplemental, but is the core of US federal policy. A review of the literature suggests that, overall, the return on US federal level investments is generally high, both economically and environmentally<sup>241</sup> albeit that the main benefits arise from only a handful of projects.<sup>242</sup> The R&D policy of the EU has been similar.<sup>243</sup>

As the three regional agreements are just that, regional, it may reasonably be expected that they would choose not to address the issue of R&D, instead leaving it to the federal government and using existing R&D policies to supplement their efforts. In fact, the regional agreements themselves have indirectly facilitated R&D by stipulating the uses that may be made of revenues. For instance, the MGGA’s first legitimate use is for ‘accelerating transformational investment’, while the WCI includes ‘research, development, demonstrations, and deployment’ as one of the public purposes to which proceeds can be contributed.<sup>244</sup>

## L LINKING AND INTERACTION BETWEEN SYSTEMS

The International Emissions Trading Association notes that linking is desirable for two key reasons:<sup>245</sup> first, it is ‘inherently more efficient, liquid, and competitive’ and, secondly, ‘provides a broader pool and greater variety of abatement [opportunities].’ As the systems discussed are all relatively young, it is unsurprising that collaboration is also young. Yet, already there are positive signs of co-operation between different systems. The MGGA draft recommendations explicitly advise ‘the participating States and province seek to link the Accord’ to the other three systems, as well as ‘other mandatory greenhouse gas reduction programs as appropriate’ and the WCI, most ambitiously, states that ‘the WCI Partner jurisdictions will seek linkages with other cap-and-trade systems so that those allowances and allowances issued by WCI Partner jurisdictions would be fully fungible.’ While the RGGI does not include provisions relating directly to linkage, it has begun an informal advisory relationship with the WCI; they ‘talk on a regular basis... to see what they found worked and what to do differently.’<sup>246</sup> The EU’s linking directive means that that three non-EU Member States are now part of the ETS, and, in a more unusual act of co-operation, the state of

<sup>239</sup> Aldy & Pizer (n 171).

<sup>240</sup> ‘[Failure] is the outcome expected from the high-risk, forward-looking research investment portfolio that the private sector is unlikely to undertake and therefore should be maintained by the federal government.’ Chow and Newell *A Retrospective Review of the Performance of Energy R&D*, (Washington RFF) 05/2004

<sup>241</sup> ‘The literature typically finds that federal energy R&D investments have on the whole yielded both substantial direct economic benefits as well as external benefits such as pollution mitigation and knowledge creation.’ *ibid.*

<sup>242</sup> *ibid.*

<sup>243</sup> See *EU action against climate change*, Research and development to fight climate change <[http://ec.europa.eu/environment/climat/pdf/brochures/research\\_en.pdf](http://ec.europa.eu/environment/climat/pdf/brochures/research_en.pdf)> (3 march 2010).

<sup>244</sup> MGGA (n 127).

<sup>245</sup> International Emissions Trading Association *Linking the EU ETS with emerging emissions trading schemes* <<http://www.ieta.org/ietawww/pages/getfile.php?docID=2419>> (2 March 2010).

<sup>246</sup> J Adair Interview in Energy Advantage <<http://www.emeraldinsight.com/Insight/ViewContentServlet?Filename=Published/EmeraldFullTextArticle/Articles/0560230409.html>> (3 March 2010).

California and the UK have forged a Climate Change and Clean Energy Collaboration to 'evaluate and implement market-based mechanisms' and 'share best practices.'<sup>247</sup> It may be advisable that, given the emergence of cap and trade systems, future proposals should include more detailed provisions regarding linkage.

## M CONCLUSION

It is now clear that cap and trade systems 'have emerged as the preferred national and regional instrument for reducing emissions of greenhouse gases throughout the industrialized world'<sup>248</sup> This is not only backed up by the four agreements discussed here, but also by the number of US proposals for such a system in the past, the calls for one in the future, and the recent call from the US president himself.<sup>249</sup>

An analysis of these agreements suggests some directions for the future of cap and trade systems. As noted, a good starting point is a strong target. Both the ETS and RGGI have started with strong targets (though the RGGI is limited by its narrow scope), and have both made progress toward these targets: 'the EU<sup>250</sup> and most Member States are on track to deliver on their Kyoto Protocol commitments'<sup>251</sup> and RGGI has resulted in advances in auctioning procedure.<sup>252</sup> The agreements suggest that it is desirable for the scope of a program to be as wide as possible from the outset for a number of reasons. A narrow scheme may make the target insignificant when looking at the bigger picture, or may invite claims of unfairness or discrimination, which are both demonstrated by RGGI. A fairly broad program, such as the ETS, MGGI and WCI, may be more open to later expansion, if it is the perceived intention of the scheme. However this is likely to be met with some resistance, possibly substantial, which does cause inefficiencies. An analysis of the use of the CDM suggests that verifiability may be a problem that is either impossible to conquer, too costly to rectify economically, or too risky environmentally. At best there is a need for extreme caution, which, as yet, does not appear to have been headed. It is submitted that future proposals, as well as existing systems, should tread very carefully in this area. Auctions have emerged as the preferred method of allocation, with some of the proceeds going to climate-related projects. However, it is submitted that further good could be done if a greater percentage of the revenues were allocated in this way, or if the systems provided that the revenues be partly used in aid of preventing competitiveness problems. As to competitiveness concerns, the strong concerns expressed by some<sup>253</sup> seem largely unfounded. Future proposals for cap and

<sup>247</sup> UK-California Climate Change and Clean Energy Collaboration.

<sup>248</sup> Jaffe and Stavins *The Harvard Project on International Climate Agreements: Linkage of Tradable Permit Systems in International Climate Policy Architecture* <<http://belfercenter.ksg.harvard.edu/files/StavinsWeb6.pdf>> (3 March 2010).

<sup>249</sup> Office of Management and Budget *A New Era of Responsibility: Renewing America's Promise, United States Federal Budget for Fiscal Year 2010* <[http://www.whitehouse.gov/omb/assets/fy2010\\_new\\_era/a\\_new\\_era\\_of\\_responsibility2.pdf](http://www.whitehouse.gov/omb/assets/fy2010_new_era/a_new_era_of_responsibility2.pdf)> (3 March 2010). The budget proposes a 10-year investment of US \$15 billion per year, generated from the auction of emissions credits.

<sup>250</sup> Referring to the 15 Member States signing the Kyoto Protocol.

<sup>251</sup> —'Climate change: projections show EU on track to meet Kyoto emission targets' EUROPA <<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1534&format=HTML&aged=0&language=EN&guiLanguage=en>> (3 March 2010).

<sup>252</sup> 'The RGGI auction design is serving as a model for CO2 cap-and-trade programs under consideration in other regions and in the US Congress.' Regional Greenhouse Gas Initiative *Executive Summary* (n 106).

<sup>253</sup> See Congressional opposition to cap and trade on this basis. '[M]any Republicans in Congress remain deeply sceptical about adopting a market-based mechanism to cut carbon emissions, fearing it may hit the

trade systems, however, should consider further breaking from the auction/free allocation dichotomy in order to alleviate the remaining competitiveness concerns. Governments may also intervene with import taxes to further alleviate concerns if necessary. In the event of an international agreement, these problems are likely to be negated. Complementary R&D policy is of great importance, given the limited investment incentives for private actors; both of which the EU and the US provide. While some linking and interaction between systems has taken place, it is suggested that further, and more formal, co-operation needs to be established.

Overall then, the analysis of the systems above suggests the desirability of an overarching, federal-level scheme to deal with climate change; a preference for a cap and trade model, with a strong target, broad scope; a hybrid system of auctioning and allocation; and provision for linking to other systems. The analysis also suggests that no one system is quite yet at this, possibly unattainable, level of advancement. However, encouraging are the actions of the EU ETS and the RGGI in leading the way and implementing cap and trade systems, and the in-depth planning process of the later MGGA and WCI agreements; both seeking to take into account the issues documented in this paper and begin their respective systems with a strong design. Further optimism can be gleaned from the knowledge that the regional systems are already using such a comparative analysis and are looking to each other for advice and ideas.

#### (a) The Future of EU and US Climate Change Regulation

As has been seen with the ETS, the EU has led to date but the true extent of leadership is questionable, as is the true extent of the efficacy of the ETS. Future US leadership and participation may well be necessary to international climate agreements.<sup>254</sup> However, the pessimism of these comments is somewhat counteracted by the fact that support ‘continues to build for federal action’<sup>255</sup> and there is ‘clear evidence that momentum toward a Federal GHG emissions trading system is building rapidly’<sup>256</sup> amid various calls for such action. The EU maintains that it will continue to play a leading role, stating that ‘the EU is ready to play its full part. We have put our bold commitments on the table.’<sup>257</sup>

International agreement remains key to the future of EU and US climate change measures and to the issue generally. According to the Bali Roadmap,<sup>258</sup> a post-Kyoto plan is to be agreed at the 2009 meeting in Copenhagen. It has been suggested that ‘Europe and the United States must start working together in the field of climate change.’<sup>259</sup> As to this required collaboration, the EU Commissioner responsible for environmental policy stated that he is ‘encouraged by the message of change’ of the new administration and will ‘welcome an ambitious US seeking to provide international leadership on this crucial challenge.’

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competitiveness of US firms and products on global markets.’ *Obama confident US will have cap-and-trade law*, American Free Press, 03/25/2009 <<http://www.google.com/hostednews/afp/article/ALeqM5haAGggDzdMTlhFb28AECt2BEFHbw>> (3 March 2010).

<sup>254</sup> Schreurs and Tiberghien (n 156) note that ‘leadership will be harder... for Europe to sustain in the future.’

<sup>255</sup> Aldy and Pizer (n 171) commenting on the multitude of congressional cap and trade bills.

<sup>256</sup> International Emissions Trading Association *Linking the EU ETS with emerging emissions trading schemes* (n 245).

<sup>257</sup> Dimas *An ambitious Copenhagen agreement is not a choice, it is a must* (High Level Segment of the Fourteenth Conference of the Parties to the United Nations Framework Convention on Climate Change Poznan 11 December 2008).

<sup>258</sup> *Decision -/CP.13 Bali Action Plan* (Adopted at the United Nations Climate Change Conference Bali 2007).

<sup>259</sup> Dimas (n 257).

