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The United States and climate change: from process to action

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INTRODUCTION

> 'We've asked for your leadership, we seek your leadership. But if for some reason you are not willing to lead, leave it to the rest of us. Please get out of the way.'
>
> – Kevin Conrad, a delegate from Papua New Guinea, speaking at the final negotiating session at the UNFCCC Conference of Parties in Bali, December 2007

Kevin Conrad's now iconic statement at the eleventh hour of the UN climate change negotiations in Bali in 2007 epitomized the frustration felt by friends and opponents alike about the United States' reluctance during the Bush administration to throw its weight behind multilateral solutions to tackle environmental challenges. Until the final days of the Bush administration, the US policy on climate change went against the grain of most of its allies in the international community during the previous decade,[1] and the United States was described as the 'rogue state' in global green politics.[2] The conflicting range of domestic interests and fractured agendas that have driven its policies on energy security and climate mitigation are also well documented.[3]

Climate change and all the associated resource challenges (in energy, food, water and land use) highlight the nature of interdependencies among states and peoples. The bulk of climate change impacts may need to be managed domestically. But environmental changes such as land degradation, water reductions, shifting agricultural zones, together with extreme weather events, will produce social stresses with effects far beyond national borders.

The implications of dangerous climate change for security and political stability are increasingly recognized by the foreign policy and defence communities in the United States. A 2007 report by the Center for Naval Analysis stated that climate change can become 'a threat multiplier for instability in some of the most volatile regions of the world, and it presents significant national security challenges for the United States'.[4] In 2008, the National Intelligence Council (NIC) completed a new classified assessment that explores how climate

change could threaten US security in the next 20 years by causing political instability, mass movements of refugees, terrorism, or conflicts over water and other resources in specific countries.[5]

Until recently, total US greenhouse gas (GHG) emissions were the highest in the world. In historical terms, the United States is responsible for around 30 per cent of the additional carbon in the atmosphere. Its emissions per capita are also among the highest in the world, more than double those of the European Union, and four times those of China. The US economy is among the most emissions-intensive in the OECD. This reflects fundamental features of the US economy and society, notably the abundance of cheap coal and other fossil fuels, vast distances augmenting the need for transport, and an expansive mode of development based on personal mobility through the motor vehicle.[6]

In the aftermath of the December 2009 Copenhagen Conference on Climate Change, and the political agreement that was reached (the Copenhagen Accord), the next section of this chapter considers afresh the scale of global challenge at hand as a result of rapid global warming. This is followed by a description of the record to date of US engagement with the regime to control global warming, including the recent changes in the domestic political landscape.

It is difficult to overestimate the importance of US action – and the cost of US inaction – to the world's ability to seek solutions to dangerous climate change. The United States has a key role in ensuring effective multilateralism so that negotiations do not deliver the lowest common denominator. This will require dealing with powerful domestic interests at home and tackling some tricky fault lines that lie at the nexus of its trade, climate change and China policies. The chapter goes on to focus on the need for a fresh look at US–China relations in the context of global energy and climate security.

During the past century, the United States has led the world by exporting its own way of life and its ubiquitous economic reach. It is easy to forget in the light of recent history that the United States was the pioneer in global environmental governance, from breakthrough technologies that have transformed our capacity to tackle emissions, to innovative legislative tools and market-based mechanisms including the design of the Kyoto Protocol. Later sections of the chapter specifically consider US leadership in low carbon innovations – and outline issues around the US role in the next phase of global climate governance.

The ability of the United States to accelerate the global transition towards a low carbon future has been hampered by its international isolation on this issue. Global climate security requires immediate action not by the United States and developed countries alone but also by the less developed economies. This means that the traditional style of US leadership – changing the world through the sheer scale of its excellence and weight in the market-place – will not suffice. The central challenge will be to accept, respect and work with the efforts of others that have over the past decade continued to shape the global response in the absence of constructive US engagement. The chapter concludes with a summary of key recommendations for the new administration towards a new strategy of engagement with the world on climate change.

MEETING THE CHALLENGE OF DANGEROUS CLIMATE CHANGE

Global climate security demands global efforts and measures to minimize global temperature rises, a point that has been reaffirmed by new scientific evidence. At the 2009 G8 summit, global leaders agreed that minimizing the probability of a 2°C rise over pre-industrial levels would be a credible goal. To give a 50: 50 chance of staying within the 2°C limit, global CO_2 emissions will need to peak before about 2020 and fall by over 50 per cent by 2050.[7]

What would a 50–80 per cent global reduction by 2050 entail? For developed countries including the United States, it implies sharp reductions, moving close to a zero-carbon economy by 2050, with major developing countries following suit well before the end of the century. It implies average annual global emissions of around 2 tonnes of CO_2 per person – less than half the present Chinese level, a fifth of the level in Europe, and a tenth of that in the US. To achieve this, all major emitting countries will need to begin radical decarbonization in the next 20 years, whatever their level of economic development.

Formal negotiations at the United Nations Framework Convention on Climate Change (UNFCCC), though critical for setting ambitious national targets, are but one component of a global climate response. The key question is whether states and markets can stimulate genuine opportunities in low carbon economic activities and investments towards energy efficiency across the globe, creating incentives to move the additional trillions of dollars in investment needed by 2030 (above the business-as-usual scenarios) into low carbon options.[8] A global agreement on climate change will have to be acceptable to all major polluting countries. But the true measure of its success will hinge on whether it generates a transformational shift in international energy finance flows, achieving:

- rapid global diffusion of existing and near-to-market low carbon and energy-efficiency technologies;
- new generations of solutions from breakthrough technologies from 2030 onwards; and
- equitable international collaboration mechanisms on technological development and transfer in order to lower the cost/risk of technology investment and to encourage national action in developing countries.

This transformation would be no mean feat at a time of volatile energy prices and a global economic downturn, unless, of course, these forces could themselves be harnessed in support of lower carbon investment. On the current trajectory, the world is clearly not yet deviating enough from the dangerous business-as-usual pathway – one that is likely to bring serious outcomes that go beyond deepened climate insecurity, such as 'resource nationalism', political instability and heightened import dependencies. Box 1 indicates likely some security implications for the United States.

Box 1: Security implications of climate change impacts on the US

The threats of dangerous climate change and environmental change to the US way of life are beginning to shape a new generation of response. These vulnerabilities afflict many different regions in the US and would require separate and distinct counter-measures. These potentially include:

- Damage to infrastructure, especially along flooded and eroding coastlines, home to many of the biggest cities in the US and much of its national product;
- Disruption to critical energy infrastructure, threatening the delivery of domestic oil supplies as pipelines are built on increasingly unstable ground (owing to melting permafrost in Alaska);
- Legislative standstill in a litigious culture (with mounting lawsuits against emitters, and between states over water supplies);
- Shifts in boundaries and territory (from coastal retreats and redrawing of maritime zones);
- Water scarcity and falling agricultural outputs (owing to severe droughts in the western and southern agricultural areas);
- Increasing economic cost with decreasing availability of insurance cover, as well as mass movement of internal refugees (as seen with Hurricane Katrina), floods and droughts.

Sources: Cleo Paskal, *Global Warring: How Environmental, Economic and Political Crises Will Redraw the World Map* (New York: Palgrave Macmillan, 2010), pp. 25–62; and Cleo Paskal, *How Climate Change is Pushing the Boundaries of Security and Foreign Policy*, Chatham House Briefing Paper, June 2007.

US ENGAGEMENT IN CLIMATE NEGOTIATIONS: WHERE WE WERE

'The world expects more from a major economy like the United States.'
– José Manuel Barroso, President, European Commission, on the eve of the 2008 G8 summit[9]

The history of US engagement at the UNFCCC provides an important starting point in understanding the potential challenges and opportunities faced by the Obama administration. This history has contributed to the mistrust between the United States and its traditional allies in Europe, as well as between developed and developing countries.

Almost two decades have passed since the 1992 Rio Convention at which almost all the world's governments, including the United States (which was among the first to ratify), agreed to the UNFCCC, a treaty that established the basic principles and institutional processes on which to take subsequent steps to avoid 'dangerous interference' with the earth's climate. Since then, the Kyoto Protocol (1997) and Marrakech Accords (2001) have been agreed, but in

these cases without US participation. These agreements aimed to set caps on carbon emissions for the world's industrialized nations, allowing them to trade emission rights with each other as well as develop emission reduction projects in developing countries.

This shift from US leadership and engagement with international efforts to combat climate change to a position of detachment highlights one of the key challenges for the United States and for the world in combating climate change – the minimal Congressional appetite for new international treaties. In July 1997, the Byrd-Hagel 'Sense of the Senate' Resolution argued that a commitment to cap greenhouse gas emissions could seriously harm the US economy, 'including significant job loss, trade disadvantages, increased energy and consumer costs' in the absence of any similar binding commitments on the developing world.[10] Eileen Claussen, the US's chief climate negotiator who resigned shortly thereafter, pointed out that a strict interpretation of the Senate resolution was incompatible not only with the realities of the global negotiations but also with the legally binding mandate for the Kyoto negotiations, which the United States had agreed to in 1995 in Berlin. The negotiating mandate precluded new commitments for developing countries on the grounds that the industrialized world had yet to meet its own promises in the original UNFCCC Treaty. Fulfilling these promises became the declared purpose of the Kyoto negotiations. Given the Byrd-Hagel Resolution, the Clinton administration never submitted the Kyoto Protocol to the Senate for ratification.

The virtually guaranteed vote against ratification was ironic since the protocol's structure had effectively been designed in Washington. The United States had proposed a legally enforceable set of commitments for industrialized countries in early 1997 – to ensure a 'level playing field' of implementation – along with market-based flexibility for where and how these commitments would be implemented. After securing Europe's support, the US delegation focused on explaining to Russia the possible benefits of international emissions trading, and to the developing world the benefits of international emission offsets – an idea that eventually emerged as the Kyoto Protocol's Clean Development Mechanism (CDM). At the Kyoto conference that December, the United States, led by Vice President Al Gore, ratcheted up its commitments in return for each degree of market-based flexibility that it secured.

The treaty design that eventually emerged was in most essential respects based on the US proposal.[11] But it was marred by a problem of US governance: international overreach compared to domestic support had simultaneously created a credible multilateral solution and destroyed the prospect of US Congressional acceptance.

The Bush administration's withdrawal from the Kyoto Protocol upon taking office in 2001 exposed this fissure for all to see. The administration abruptly announced that the agreement was 'fatally flawed' and declared it dead.[12] This became a focal point around which most of the world (except Australia) rallied. Energized by America's behaviour, and especially the abrupt manner of its withdrawal from Kyoto, the EU responded by asserting leadership to rescue the

efforts of ten years of global negotiations among nearly 200 countries. Climate change was firmly placed on the agenda of European heads of state, and the issue came to be seen as a test of the EU's credibility with regard to global responsibilities. Stung by US scepticism about Europe's seriousness, the EU also made a remarkable volte-face to embrace the US-pioneered 'cap-and-trade' approach as the key instrument of implementing emissions reductions.

The near-global effort delivered a political agreement that was transcribed into the Marrakech Accords in November 2001, while the United States looked on. It took another three years' diplomacy, increasingly centred upon Russia, to bring the Kyoto Protocol into force as a legally binding treaty, activating the global carbon market mechanisms that US negotiators had done much to pioneer.

The decade following Byrd-Hagel saw the United States grow increasingly isolated in its recalcitrance on climate change.[13] If the main dividing line over climate change in the 1990s was between businesses and environmental interests, US climate policy under the Bush administration appeared to owe as much to instinct and ideology as to considered strategy. President Bush only ordered a review of US climate change policy after withdrawing support for Kyoto in March 2001.[14] The subsequent Clear Skies and Global Climate Change Initiatives focused on voluntary measures and indices (notably an energy intensity reduction of 18 per cent over ten years, only a little above the historical trend) that were never likely to stem the rise in US emissions. President Bush emphasized that he would not 'commit our nation to an unsound international treaty that will throw millions of our citizens out of work'.[15]

The Kyoto Protocol's entry into force without US participation in February 2005 reinforced the international political divide. US attempts to forge international alternatives to the UNFCCC negotiations, such as the Asia-Pacific Partnership on Clean Development and Climate, and the Major Economies Meetings on Energy and Climate Change (MEM), were greeted with scepticism in many European capitals.[16]

Over this same period, however, US public opinion on the need for urgent climate action strengthened, with increased legislative activity. The 2003 Lieberman-McCain Bill, proposing caps on US emissions, drew 43 votes in the Senate. The trend was reinforced as the popular media extensively explored the links between warming temperatures and natural disasters in the wake of Hurricane Katrina and Al Gore's popular film *An Inconvenient Truth*. *Business Week* magazine declared that 2006 'was the year global warming went from controversial to conventional for much of the corporate world'.[17]

Following the 2007 release of the IPCC's Fourth Assessment Report, doubts about the links between human activity and climate change all but evaporated.[18] US grassroots political momentum generated considerable local, state and regional pressure for federal climate action through a cap-and-trade system coupled with international commitments. 'Mitigation through litigation' has also fast been gaining ground.[19]

The victory of Barack Obama in the presidential elections in November 2008 capped this shift in the US political tide towards treating climate change

as a serious challenge to US interests and making significant GHG reductions a central policy objective. President Obama's early appointments of Stephen Chu, Todd Stern, John Holdren, Jane Lubchenco, Carol Browner[20] and others to senior positions in the administration all pointed to a new phase of US engagement and, potentially, leadership on this issue. However, the world to which the Obama administration now turned its attention in terms of climate policy had evolved significantly.

INTERNATIONAL DEVELOPMENTS

The world was not idle during the US absence from the international climate arena. The major developments divided into two clear stages, marked roughly by the first and second term of the Bush presidency. The first stage grappled with fundamental uncertainty about whether the supporters of the system built over the previous decade would succeed in rescuing the fruits of that long diplomatic endeavour. Institutional processes continued to put in place the details of institutional machinery, but they remained largely moribund without resolution. However, with widespread international efforts to persuade Russia to ratify finally succeeding in November 2004, thereby bringing the Kyoto Protocol into force, the framework for setting meaningful targets for carbon emissions by its signatories was largely secured.

Domestic legislation in key countries followed swiftly, and the private sector began to invest on the basis of a legally secure international regulatory regime. In effect, the world moved into a second stage characterized by stalemate between the United States and the rest of the world. The G8 continued to strive for accommodation, but a number of multilateral efforts started to focus beyond the Bush administration. These continued to develop the main international machinery and to lay the foundations for the next round of multilateral negotiations.

In terms of implementation, the cornerstone of the global mechanisms was the EU Emissions Trading Scheme (ETS) and its links with the global Kyoto mechanisms. These gave economic value to emission reductions both within the EU and globally. The first phase of the EU ETS, 2005–07, embodied a good market design, and its first year saw carbon prices higher than expected, fuelling an explosive growth of investment in emission-reducing projects under the Clean Development Mechanism. However, the first EU ETS verification data reports in May 2006 revealed a substantial net surplus of emissions allowances, the combined result of over-allocation and greater than expected emission reductions. The price of carbon collapsed over the rest of that year, but the carbon markets continued to trade on the basis of expectations for the second phase, synchronized with Kyoto's first commitment period of 2008–12.

For Phase II, the EU made a big step towards fixing the problems with the overall level of allocation, such that, during 2008, the EU ETS supported a carbon price above €20 per tonne of CO_2 until 2012, several times the price in the United States' voluntary markets. However, many imperfections remain. In

spring 2007, the European Council pledged to cut EU greenhouse gas emissions by 2020, unilaterally by 20 per cent relative to 1990 levels, or by 30 per cent in the event of a global deal. In January 2008, the European Commission presented its proposals for implementing these ambitious goals. These included a radical redesign after 2012, with tougher caps and a wholesale move towards auctioning, which would generate tens of billions of euros annually – some of which, the Commission recommended, could be channelled to support low carbon technology R&D. Despite fierce lobbying to weaken the proposals, the essence of the EU package for 2013–20 – with deeper cutbacks in the EU ETS and much higher levels of auctioning – was adopted by the Council in December 2008. If there is one fundamental lesson from the EU ETS, it is that building into a system the capacity to learn and evolve over time is crucial – and, fortunately, that is one thing that the EU design got right.

The importance of the international carbon markets, largely financed through the EU ETS commitments and Japanese investment, cannot be overestimated. More than 4,000 projects have officially entered the CDM pipeline, through which projected emission savings to 2012 total close to 2,000MtCO_2e. The UNFCCC estimates that the value of credits under the CDM and Joint Implementation mechanism is US$4.5–8.5 billion annually, and that they leverage roughly ten times this amount towards emission reduction projects from the private sector. A market estimated at a minimum of US$50 billion per annum is not going to disappear; one of the few concrete decisions already taken under the post-2012 Kyoto Protocol negotiations is that the global carbon mechanisms will continue in place beyond this deadline.

Away from the carbon markets, the UNFCCC processes continued to ratchet up the pressure to launch global negotiations. The Heiligendamm G8 summit in June 2007 reached a consensus that the world needed negotiations on future actions under the UNFCCC, leading all eyes to the Bali UNFCCC conference in December that year.

The Bali Action Plan opens with a commitment to establish a 'shared vision for long-term cooperative action' – set immediately in the context of 'common but differentiated responsibility and respective capabilities'.[21] The undertaking by developed countries to establish 'quantified emission commitments' was a major US concession, reversing the Bush administration's rejection of quantified emission caps. It remains unclear whether the Bush administration realized it was signing up to language almost identical to that in the Berlin Mandate that launched the Kyoto negotiations, some 13 years earlier. It begs the obvious question as to why the United States has a separate negotiating track for quantified commitments post-2012 while all other industrialized countries are already negotiating second-period commitments under the Kyoto Protocol. The relationship between these two processes bedevilled negotiations in the run-up to Copenhagen.

The concomitant commitment of developing countries to negotiate 'new and additional actions' (a major concession given their earlier intransigence) was matched by the commitment by developed countries that this concession

would be 'supported by technology and enabled by financing and capacity-building'. Which of these two commitments was to be 'measurable, reportable and verifiable' was the stumbling block on which Bali almost collapsed; the final compromise was that both would be. Deforestation, adaptation, technology development and transfer, and financial resources also formally had equal prominence in the Bali Action Plan. However, none of these elements were resolved either in terms of detail or with regard to the exact timeframe. The Pew Center's post-Bali assessment observed that 'delegates remained far apart on fundamental issues but in the end agreed to launch a loosely framed negotiating process'.[22] A review of the outcome noted: 'Complexity hardly captures it: Bali has launched the most complicated and interrelated set of global negotiations in diplomatic history.' The nail-biting negotiations that were officially scheduled for completion in Copenhagen in December 2009, and which led to a political accord, testified to the difficulties around global target-setting as well as agreement on the timeframe.

LESSONS OF 2009: COPENHAGEN AND THE DEBATE ON MULTILATERAL PROCESSES

Despite the crucial importance of national and regional initiatives, the world ultimately cannot solve the climate problem without an effective multilateral approach. Ironically, the election of a more multilateralist US president and the events of 2009 culminating with the Copenhagen Accord have only served to increase debate around the form it might take and how inclusive it needs to be. In reality, any major deal is always built upon smaller coalitions of powerful actors. Many proposals have been made for a core of US leadership, bilateral or trilateral leadership by variants of the US–EU–China/Japan/Asia nexus, the G8, the G8+5, the G20, or the Major Economies Forum (MEF). Doubtless, action by most of these groupings is necessary, though it is also of interest that the MEF process did not reach any specific deal until the relationships fostered during the year were put under the pressure of the Copenhagen summit. Ultimately all such efforts face serious limitations if there is no recognition of the need for a truly multilateral framework. This is for three main reasons: scope, competitiveness and political legitimacy.

First, carbon emissions are so widespread geographically that any subset of countries becomes increasingly unable to solve the problem unless others are involved. The dominance of US, EU and Chinese emissions today would be swamped by 2050 if these countries delivered steep reductions while others did not. And none of these are significant contributors to land-use emissions (such as deforestation), which involve a wholly different group of countries. Moreover, models which centre upon innovative solutions by a 'critical mass' of the private sector diffusing technology and investment globally without government incentives can founder – carbon capture and storage (CCS), which inevitably involves significant extra costs over and above coal plants without CCS, is a case in point.

Second, a partial solution that encompassed the big emitters would not solve the perceived risks of loss of competitiveness in energy-intensive sectors *vis-à-vis* non-participants (to smaller economies such as Singapore, for example).

Third, a deal between the big emitters only is unlikely to secure global legitimacy. In no legal or moral system can a solution be imposed by those inflicting the damage, without at some level engaging those that would most suffer the consequences of inadequate action.

Thus all roads ultimately lead back to the need for a global deal. That was perhaps the most difficult, but ultimately completed, journey for the Bush administration, as it conceded at the G8 Heiligendamm summit in June 2007 the need for solutions to be negotiated under UN auspices.

Notwithstanding the relative success of the Bali negotiations, most of the key difficulties, fault lines and questions that arose in the 1990s remained unresolved. A commentary by David Sandalow[23] argued that the Bali battle over emission targets showed that the EU has learned nothing about realistic engagement with the United States; Japan sat uneasily in its seat as a potential but never actual mediator on the transatlantic divide; and a resurgent Russia remained largely apart.

For its part, the Obama administration, while embracing more seriously the UN negotiations launched under its predecessor, placed equal emphasis upon other efforts – notably high-level bilateral discussions with China and a restructured 'Major Economies Forum', which the United States sought (with limited success) to limit to around 20 countries. During 2009 many smaller countries under the UNFCCC expressed growing anxiety about the extent to which negotiations between key players were being conducted in other forums.

The culmination of this process in Copenhagen in December 2009 has reinforced the discourse about multiple forums and subgroups. The final day's negotiations that led to the Copenhagen Accord were conducted largely between the United States., China, India, Brazil and South Africa, albeit subsequently expanded to a wider group. The European Union was uncharacteristically divided, and played a minor role in brokering and drafting the accord. The final outcome was very convoluted: there is little doubt that President Obama played a critical role in leveraging global pressure to strike a deal with the major developing countries, but his premature announcement of success on CNN infuriated many other heads of state at Copenhagen who had not been involved. Only with difficulty did UN Secretary-General Ban Ki-moon and others persuade the Conference itself to formally accept the *fait accompli* – and then only with an ambiguous 'noting' of the Accord, which invites countries officially to sign up with their agreement and commitments, an unprecedented manoeuvre in a UN setting.

In principle, US leadership could yet transform the politics *vis-à-vis* Russia, and the United States could also use its political muscle to persuade additional countries to accept stronger binding commitments – South Korea has already indicated willingness to accept emission caps, and several others clearly could be drawn in, including Mexico, Turkey, possibly South Africa and some Latin American and Southeast Asian countries. However, the Obama administration

would still need to explain to the US public why it is simply not possible, or even desirable, for most developing countries to adopt binding national caps in the next phase.

Yet all this is conditional on US domestic credibility. The crucial undercurrent throughout 2009 was the twists and turns of the Obama administration's struggle to get Congressional support for domestic legislation to curb carbon emissions. The fact that this could not be completed during the year drastically curtailed what it could offer internationally. Many blamed China for the inability to get a stronger deal at Copenhagen. But China did offer an emissions target for the first time in the run-up to the summit, and did finally make important concessions on monitoring and verification. The United States could offer almost nothing. The goodwill and forbearance of the rest of the world towards the new administration is unlikely to last through 2010 if it is unable to deliver serious domestic action.

One enduring spike among many thorny issues the world must now face is how the efforts to get more significant action by the United States and China, and to set them in a multilateral context, will relate to the Kyoto system – America's own offspring that it so vehemently rejected in the past. The negotiations on second Kyoto period commitments were also due to culminate at the Copenhagen COP-15. The efforts by other industrialized countries to abandon this legally binding treaty in favour of a single global agreement including clear commitments for the United States and major developing countries crashed disastrously at Copenhagen. The attempts to merge the negotiations on future commitments under Kyoto with the Bali track of negotiations took up precious time in the first week, which contributed to delaying the potential negotiation outcome. The developing countries bluntly refused to accept a proposition that weakened the legal status of commitments on industrialized countries (albeit excluding the US) while trying to increase their own commitments. The rest of the OECD has yet to escape the process of negotiating commitments for Kyoto's second period.

It remains unclear whether the EU's fundamental need is to have the US in a unified treaty structure – akin to the US insistence that China must be on the same legal footing – or to know that the US is taking broadly equivalent action. Undoubtedly, there is a need for fresh thinking and new ideas. However, an obsessive debate about alternate forums risks obscuring the fundamental fact – endlessly emphasized by developing countries in particular – that if the United States cannot sharply reduce its emissions then there is no basis for a global deal. A country dedicated to market-based responses, whose per capita emissions are among the world's highest, that had already agreed under President Bush to negotiate quantified commitments post-2012, and whose president now has a clear mandate and commitment to cap-and-trade legislation, cannot dodge the core need for a domestic commitment that matches up to its aspirations for global architecture and ongoing negotiations.

That remains a challenging test of US leadership for President Obama. Perhaps more than trying to juggle international architecture, therefore, the most

obvious area in which the United States could deliver fresh thinking might be in relation to global collaboration to achieve low carbon technology transitions.

FINDING A WAY OUT OF THE CHINA QUESTION: THE TRADE–COMPETITIVENESS AXIS

> In America they call it the China question. In Europe they call it the America question.
>
> – *The Economist*, 19 June 2008

Despite the new political impetus, fears over US industries' loss of international competitiveness and the implications for trade policy stand as politically charged stumbling blocks against ambitious climate measures in the United States.[24] As one analyst observed, 'The politics and the economics of cutting global warming emissions are "out of synch" … Good economics rarely trumps bad politics.'[25] Only a few industries – metals, paper, chemicals and cement – may be at risk, at just over 3 per cent of US output in 2005 and less than 2 per cent of its jobs.[26] The potential economic boom expected from aggressive investment in clean energy is increasingly being recognized. In 2007, the renewables and energy efficiency industries generated more than 9 million jobs in America and $1,045 billion in revenue.[27] Despite these projections, deep political anxieties persist, especially on the future of US manufacturing. These concerns play out most explicitly through the discussions on 'carbon leakage' – the relocation of high-emitting industries or investments to developing countries that do not have a cap on carbon. Throughout 2009, many US legislators have championed proposals to impose border tariffs on exports from developing countries not taking 'comparable actions' to limit GHG emissions.[28]

Whatever the reality of the economics, the politics of carbon leakage is significant. Unilateral action to impose border tax adjustments outside any global climate agreement is likely to prompt trade-related retaliatory actions, especially if the first steps are taken by the United States with its high current and historical carbon impact. It will also dampen trust. Within such a politicized context, efforts to construct a low carbon energy future for developing countries can be thwarted by the concerns of special interest groups.

The backlash against global trade overall in US politics is another cause for concern. Ambitious decarbonization targets cannot be met by domestic action alone. Trade and investment in low carbon, energy-efficient goods and services are the best tools in the arsenal for mobilization towards a global low carbon future. Enhancing low carbon trade could create virtuous cycles that stimulate further investment opportunities.

What lies behind much of the US concern about its economic competitiveness is the increasing might of emerging economies. China holds an estimated $790 billion in US Treasury bonds – or national debt – overtaking Japan as the world's largest holder of US government debt.[29] Any reduction in China's dollar assets could hit the US economy hard by driving up long-term yields

on US bonds. This would exacerbate pressure on US interest rates and further weaken the dollar. US discomfort is also aggravated by the widespread belief in Washington that China's currency has been artificially held low against others, thus allowing China to export goods more cheaply and contributing to America's $202 billion trade deficit with that country.

In fact, little of China's carbon-intensive production is actually sold in the United States: less than 1 per cent of its steel, 3 per cent of aluminium and 2 per cent of paper.[30] Border tariffs on energy-intensive products would have little meaningful economic impact in the medium term, especially if the real goal is to stifle competitive exports from China overall rather than tackling carhon leakage.

In addition, as manufacturing supply chains integrate across borders, components are often manufactured in one country and then shipped to China or another country for final assembly. Goods are tagged only at their final assembly point. This means that the gross value of exports is not necessarily indicative of economic benefits for the exporting country. Trade figures, as a result, are increasingly inaccurate guides to reality. While China has a trade surplus of some $200 billion with the United States and €110 billion with the EU, it also runs a significant trade deficit with the rest of Asia. China has effectively absorbed part of the surplus that the rest of Asia had with the developed world. For every US$1,000 of Chinese exports to the United States, only US$386 of value accrued in China in 2002.[31] As a specific example, only 35 cents of a Barbie doll that sells for US$20 go to China.[32] Moreover, the majority of China's trade in high-tech products stems from processing operations, of which 80 per cent are carried out by foreign companies established in China, many of them US companies.[33]

Political economy considerations aside, there is no doubt that choices made in China matter. Its immediate decisions about its infrastructure needs and patterns of consumption will have a decisive impact on global efforts to stabilize greenhouse gas emissions and on the feasible rate of reduction to sustainable levels. It recently overtook the United States as the world's largest emitter, and if it continues on a high carbon path, global efforts to mitigate climate change will be seriously constrained.

In recent historical terms, no major economies have managed to decouple economic growth from heavy emissions at early stages of development. There are no off-the-shelf low carbon developmental models for countries like China and India to emulate. The stark differences in economic circumstances should necessitate a collaborative rather than a confrontational approach.

Much is made of China's opening of one or two major coal power stations every week, and the $3.7 trillion of energy investment it will make by 2030. However, the concurrent closure of power stations in the United States and Europe owing to ageing infrastructure and continuing, if modest, demand increases will require both of them to invest in a similar level of new generating capacity over the same period. China, the US and the EU all need to make decisions today to avoid locking in carbon-intensive investments in the coming decades.

Despite the political difficulties, it is in the United States' strategic interest, therefore, to collaborate with China on large-scale decarbonization. Billions of

dollars could be saved for such efforts if the two countries put their capital and manufacturing might behind the production of low carbon goods and technologies, driving down the costs of decarbonization for all. For this approach to be acceptable politically, fears in the United States over its competitiveness will need to be addressed clearly, and the US public will have to be convinced that China is doing its best to address climate change.

What is needed from China are concrete efforts to pilot low carbon development on a scale large enough to catalyse change at the national level. One idea is for the United States to work with China and the EU to create low carbon zones in China.[34] Such collaboration will provide the right signal for investors worldwide to hasten capital flow into cleaner technologies that would first be used in the low carbon zones and then diffused throughout their economies. More focused US–Chinese collaboration around these zones – from joint R&D to common efficiency standards – can also generate the scale effects that strengthen the constituencies in China who are beginning to view low carbon economic transition as consistent with the government's wish to move away from high-emission, low value-added exports in its growth model.

FUELLING INNOVATION FOR LOW CARBON TECHNOLOGIES

The reluctance on the part of the United States to commit to international political agreements on climate change is compounded by its vitally important – but as yet unfulfilled – role in accelerating the global development, dissemination and market establishment of new low carbon technologies and practices. With leading scientists in key positions in the Obama administration, the United States now looks set to regain ground on technological leadership on climate change. This will be welcomed across the world, but past experience suggests that such leadership will be in no country's interest more than that of the United States itself.

History has demonstrated that, when the United States focuses serious and sustained political effort on technological development in a given sphere, its industry rapidly becomes a global leader – and everyone gains. It has played a pivotal role in most transformational technological developments since the 1900s – from automobiles, space technologies and the agricultural green revolution to the personal computer. For over a hundred years before 1980, the energy sector fitted this trend: the United States started the global transition to a petroleum economy after the first commercial oil well was drilled in 1859 and embedded it through mass production of the combustion engine. A pioneer in the nuclear industry, it brought 51 reactors (43GW capacity) into operation in the 1970s alone – a remarkable feat of energy engineering.

But the experience of the energy sector also shows that the United States can fall away from technological leadership if political will is not sustained. In response to the two 1970s oil shocks, the Department of Energy had a budget for energy research as high as $6 billion at the end of the decade. About $1 billion of this total was focused on renewable energy – particularly solar power

but also wind, geothermal, hydro and biofuels. For a short time, the country led the way in alternative energy technologies. Then, with low oil prices in the 1980s and President Reagan's emphasis on controlling government spending, total Department of Energy research budgets fell below $2 billion in 1985 and had not exceeded this by 2008.[35] Once a leader in solar power, the United States rapidly lost and never regained market share to Japan and Germany. More importantly, US dependence on conventional energy was left essentially unchanged. Renewables provided 6 per cent of America's energy in 1973 and 7 per cent in 2006.

External frustration with the US position is thus rooted in the convictions that Americans are among the most effective in delivering technological transformation on a global scale – and are also set to be one of the largest beneficiaries, once the country's innovators take on the mantle of low carbon technological leadership. The alternative for the United States is to cede this role to EU and emerging economies eager to grow into the strategic industries of the next few generations. Progress towards a global low carbon economy would inevitably be slowed from such a US abdication, with serious consequences for greenhouse gas emissions.

The same lack of political focus may only rarely have allowed the limited public investment in alternative technologies since the 1970s to provide a good return. US academics have led analysis of the technology 'valley of death' in which publicly funded energy innovations languish for decades without being taken forward as commercial developments, owing to a combination of failures around technology push and demand pull forces in the energy sector.[36] Persistent policy uncertainty has entrenched a pattern of boom and bust in the renewables and energy efficiency industries. This stands in contrast to greater certainty and resources provided to the development of conventional technologies related to oil, gas and coal.

It is thus imperative that the Obama administration send unambiguous signals to the market in the direction of change to encourage large-scale investment in the innovation and deployment of low carbon technologies. Early signs have been promising – the first major boost in investment was announced via the 'green recovery' elements of the February 2009 economic stimulus package, and was soon followed by the substantial provisions for clean energy innovation in the American Clean Energy and Security Act, passed by the House of Representatives in June 2009 (committing around $100 billion out to 2025 for research and demonstration of CCS, electric vehicles and advanced renewable and energy-efficiency technologies). Yet great uncertainty over the passage of climate and energy legislation through the Senate raises doubts about the administration's ability to raise federal support to the levels of funding of the 1970s, and to sustain them. The particular uncertainty over establishing a carbon price in the United States via a trading scheme (or tax) will give pause for thought to those looking to invest in innovation, or those ready to respond to the new and potentially sustainable revenue streams these could provide for research.

US politicians are struggling to establish a narrative that fundamentally repositions the US economy towards a low carbon future, making it clear that

this vital technological shift will not be allowed to fail. Yet there are great opportunities for the United States to lead in the technology race towards low carbon options which can underpin such a vision. In a study conducted by Chatham House on six energy technologies and patents, the top ten reported locations of patents assignees are primarily OECD economies, with the United States in the lead.[37]

Analysis in the same study demonstrates that critical innovations in energy technology are spread around the world, with a gradual shift to emerging economies. To speed up innovation in low carbon energy globally, cooperation will therefore be essential. Today, only 2 per cent of patents are co-owned by an OECD-based organization and one based in a developing country. In the light of this, successful implementation of the US–China Summit 2009 agreement to facilitate joint research and development on clean energy could be critical. Teams of scientists and engineers from both countries are set to benefit from public and private funding of at least $150 million over five years, split evenly between the two countries. Priority topics to be addressed include energy efficiency in buildings, clean coal (including CCS) and clean vehicles.

The real lesson of experience with energy and environmental innovation is that it requires not only a supportive cultural environment, but a combination of public R&D, market-based incentives and appropriate regulatory structures. The United States showed that direct regulation of an industry can significantly contribute to improving its environmental impact by providing incentives to innovation. The Electric Power Research Institute (EPRI), which pools the research capacities of US utilities firms, illustrates the value of cooperation in an industry where no one actor has sufficient capacity of its own. Further regulation such as the Clean Air Act prompted rapid technological progress.

On the rising tide of US interest in the use of prizes to spur innovation, the Obama administration could spearhead a Global Climate Technology Prize Fund to reward innovators for their R&D for climate change mitigation and adaptation. The method has proved successful in medical innovation and holds promise for the climate sector. Public money would only be awarded after an innovation achieves the objective of the prize. Another major advantage of prizes is that only the problem needs to be identified. The rest can be left to the creativity of participants to produce solutions. Unlike with grants, there is no need to prescribe the shape and form of the final outcome. The winning technology can also be made available for licensing and diffusion, giving prizes a potential advantage over patents. The prize need not consist only of cash – the US government, for example, has guaranteed public procurement for the winning technologies of an efficient lighting competition. Google has offered to invest in for-profit companies that are successful in its plug-in hybrids competition. Prizes could be used to stimulate innovation on climate technologies, from a global prize to reduce carbon emissions funded by a specific tax or tax credit, to prizes to address issues of particular local concern. Awards could also be offered for non-technological achievements, such as for local governors who implement emission-reduction measures; for financial institutions that develop effective

ways of lending for clean technology investment; or for management innovations that enhance the effectiveness of climate-related research institutions.

CONCLUSIONS: CHARTING THE PATH TOWARDS GLOBAL DECARBONIZATION

The historically unprecedented need to change the course of entire industrial sectors – with new infrastructure and investments – offers unique opportunities to take positive steps away from highly polluting paths and towards a sustainable low carbon future. However, unilateral measures cannot deliver global climate security. Unilateral steps that trigger political backlash in the arena of global trade would be damaging, generating further distrust and slowing down the much-needed dissemination of low carbon economic options. For much of the last century global changes ensued when the United States believed in their inevitability. The real test of US leadership is subtly different this time round: it requires using the power and imagination of US inventors and entrepreneurs alongside an enabling legislative, funding and regulatory environment to take the existing global effort to the next stage.

The EU is the first major emitter to accept the inevitability of the required transition and has already started down a path intended to lead to decarbonization. Having raided a US toolbox in terms of emissions trading, the EU has made commitments which have been crucial in forming expectations in global business that action on climate change will happen and will create real markets. But solving the problem requires global commitments to decarbonization that are much more widely and urgently applied, most notably by the United States and China alike. The global transition is only likely if these three powers can find a way to lead together, and address the need not only for clear economic incentives but also for radical innovation.

This perspective underpins the approach outlined in this chapter whereby the United States adopts a trilateral political-economic approach: energizing the multilateral process through strong domestic commitment; injecting new ideas around innovation; and forging strategic low carbon partnerships with China and the EU.

First, even though the Obama administration faces an uphill battle in 2010 to put in place ambitious domestic legislation on climate change, this is the only platform from which it could *re-energize multilateral efforts* including setting ambitious emissions targets through the UNFCCC and other forums. Even though the Copenhagen Accord laid 'the foundation for international action in the years to come', according to President Obama, it remains unclear how the world will act in concert within a linked system of incentives to drive more ambitious target-setting that would limit the global temperature rise to 2°C, not least by developed countries. A more ambitious 2020 or 2030 target by the US would energize the ongoing climate negotiations to reach a global long-term agreement around the key issues of adequate emission reductions, finance for decarbonization and adaptation, sufficient new and additional actions by

developing countries, and international frameworks for technology transfer and halting deforestation.

Second, the time has come for the United States to *spearhead a dramatic acceleration in climate-related technological innovation and diffusion*. As the long-recognized leader of innovation and free enterprise, the US government could do much more not only in terms of setting international standards but also in driving innovation.

Third, it remains in the US strategic interest to *forge strategic low carbon partnerships with China and the EU to ensure market creation for a global transition to a low carbon economy*. Such efforts would receive a huge boost if all three regions put their capital and manufacturing might behind the production of low carbon goods and technologies, driving down the costs of decarbonization for all. For this to be politically acceptable, competitiveness fears will need to be directly addressed, and the US public will have to be convinced that China is doing its best to address climate change.

Finally, at home, the Obama administration *must make it a priority to bury the narrow view of action to confront climate change as the foe of US industry and competitiveness*. The cost of carbon emissions must be factored into economic policy, and the market will ultimately benefit from strong government regulation over emissions and consistency of policy and investment towards renewable energies and efficiency. European examples have shown that institutionalized government commitment to reduce emissions can create huge economic and technological incentives and gains. If US policy-makers can embed irrevocable signals to reorientate the US economy towards low carbon development, then the transition to a low carbon future could be faster, and more global, than anyone expects.

NOTES

1 See, for example, Joanna Depledge, 'Against the Grain: The United States and the Global Climate Change Regime', *Global Change, Peace and Security* 17(1)(2005): 11–27.
2 Robert Falkner, 'American Hegemony and the Global Environment', *International Studies Review* 7 (2005): 585–99.
3 See, among others, Depledge, 'Against the Grain' and Falkner, 'American Hegemony and the Global Environment'.
4 *National Security and the Threat of Climate Change,* US Center for Naval Analysis, 4 June 2007.
5 Testimony by Dr Fingar in 'National Intelligence Assessment on the National Security Implications of Global Climate Change to 2030?', 25 June 2008 to the US Congress; and press release, 'Climate change may challenge national security, classified report warns', The Center for International Earth Science Information Network (CIESIN), Columbia University, 26 June 2008.
6 Depledge, 'Against the Grain'.
7 M. Meinshausen and W. Hare, *How Much Warming Are We Committed to and How Much Can Be Avoided?*, PIK Report 93 (2004), Figure 8. According to the Swedish Scientific Council on Climate Issues, in *A Scientific Basis for Climate Policy* (2007), the two-degree target can likely be achieved if greenhouse gas concentration in

the atmosphere is stabilized in the long term at 400ppmv carbon dioxide equivalent (CO_2e). If it is stabilized at 450 ppmv CO_2e there is a significant risk that the two-degree target will not be achieved. Full report available at: www.sweden.gov.se/content/1/c6/08/69/68/f8d98215.pdf.

8 IEA, *Energy Technology Perspectives 2008* (Paris: International Energy Agency, 2008).

9 Reuters, 'U.S. must move on climate change at G8: Barroso', 4 July 2008.

10 Byrd-Hagel Resolution (S Res 98), July 1997.

11 For a detailed history of the negotiations and content of the Kyoto Protocol, see M. Grubb, D. Brack and C. Vrolijk, *The Kyoto Protocol: A Guide and Assessment* (London: RIIA/Earthscan, 1999).

12 M. Grubb and J. Depledge, 'The Seven Myths of Kyoto', *Climate Policy* 1(2)(2001): 269–72.

13 This isolation was dramatically demonstrated at the end of 2007 when at the UNFCCC meeting in Bali the newly elected Australian Prime Minister announced Australia's intention to ratify the Kyoto Protocol. Australia had been the last of the United States' traditional allies supporting its position of rejecting the protocol.

14 While the United States has not ratified the protocol it remains a signatory. The ideological stance was by no means confined to the issues of climate change. The Kyoto Protocol was quickly denounced by the Bush administration alongside the Rome statute (establishing the International Criminal Court), the Comprehensive Test Ban Treaty (outlawing nuclear testing) and the Anti-Ballistic Missile Treaty (preventing the United States and Russia from deploying missile defences). See Depledge, 'Against the Grain'.

15 Speech by President George W. Bush Introducing Clear Skies and Global Climate Change Initiatives, 14 February 2002, http://www.whitehouse.gov/news/releases/2002/02/20020214-5.html.

16 For analysis of the Partnership's relationship with the Kyoto process see Jeffrey Mcgee and Ros Taplin, 'The Asia-Pacific Partnership on Clean Development and Climate: A Complement or Competitor to the Kyoto Protocol?', *Global Change, Peace and Security* 18(3)(2006): 173–92.

17 *Business Week*, 'Best of 2006', http://images.businessweek.com/ss/06/12/1207_bestideas/source/11.htm.

18 Trevor Houser, Rob Bradley, Britt Childs, Jacob Werksman and Robert Heilmayr, *Leveling the Carbon Playing Field: International Competition and US Climate Policy Design* (Washington, DC: Peterson Institute for International Economics/World Resources Institute, May 2008), http://pdf.wri.org/leveling_the_carbon_playing_field.pdf.

19 The US Environmental Protection Agency (EPA) is under orders from the Supreme Court to determine whether CO_2 emissions are endangering public health or welfare. If so, the EPA must regulate them. Another court told the Interior Department to decide whether the polar bear should be brought under the protection of the Endangered Species Act as a result of the impacts of climate change.

20 As, respectively, Secretary of State for Energy; Special Envoy for Climate Change; Executive Director of the White House Office of Science and Technology Policy and the President's science adviser; Head of the National Oceanic and Atmospheric Administration; and Assistant to the President for Energy and Climate Change.

21 This section draws in part on M. Grubb, 'The Bali COP: Plus ça change, plus c'est la même chose?', *Climate Policy* 8(1)(2008): 3–6; see also Meeting Report in the same issue by H. Ott et al. (pp. 91–5).

22 Summary of COP13 and COP/MOP 3 prepared by the Pew Center on Global Climate Change, http://www.pewclimate.org/docUploads/Pew Center_COP13Summary.pdf.
23 D. Sandalow, 'Climate Change – beyond Bali', http://www.brookings.edu/opinions/2007/1217_climate_change_sandalow.aspx.
24 For a recent analysis on competitiveness and climate measures, see Houser et al., *Leveling the Carbon Playing Field*.
25 Bruce Stokes, 'Balance of Payments: Carbon Accommodation', *Congress Daily*, 12 June 2008, http://0-www.nationaljournal.com.libus.csd.mu.edu/congressdaily/bpa_20080612_4856.php.
26 Houser et al., *leveling the Carbon Playing Field.*
27 American Solar Energy Society and Management Information Services Inc., 'Defining, Estimating and Forecasting the Renewable Energy and Energy Efficiency Industries in the US and Colorado', December 2008, http://www.ases.org/images/stories/ASES/pdfs/CO_Jobs_Final_Report_December2008.pdf.
28 See, for example, the letter to President Obama on this issue signed by 28 Congressmen of 9 September 2009, http://www.steel.org/AM/Template.cfm?Section=Climate_Change_Focus&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=34342.
29 US Department of the Treasury, 'Major Foreign Holders of Treasury Securities', 17 November 2009, http://www.ustreas.gov/tic/mfh.txt.
30 Houser et al., *Leveling the Carbon Playing Field.*
31 Lawrence J. Lau, Xikang Chen, Leonard K. Cheng, K. C. Fung, Jiansuo Pei, Yun-Wing Sung, Zhipeng Tang, Yanyan Xiong, Cuihong Yang and Kunfu Zhu, *Estimates of U.S.–China Trade Balances in Terms of Domestic Value-Added*, Stanford Center for International Development, Working Paper No. 295, September 2006.
32 The figures were cited in David Barboza, 'Some assembly needed: China as Asia's factory', *New York Times*, 9 February 2006.
33 Guillaume Gaulier, Françoise Lemoine and Deniz Ünal-Kesenci, *China's Integration in East Asia: Production Sharing, FDI and High-Tech Trade*, CEPII Working Paper No. 2005-09, June 2005, www.economieinternationale.fr/anglaisgraph/workpap/pdf/.../wp05-09.pdf.
34 The idea for low carbon economic zones was first suggested as a means to rally EU–China collaboration on energy and climate security. See Bernice Lee, Antony Froggatt, Nick Mabey et al., *Changing Climates: Interdependencies on Energy and Climate Security for China and Europe*, Chatham House Report, November 2007.
35 The budget for 2008 was set at $1.3 billion: www.aaas.org/spp/rd/prel08p.htm.
36 J.P. Holdren et al. (President's Committee of Advisors on Science and Technology, Panel of Energy Research and Development), *Federal Energy Research and Development for the Challenges of the 21st Century* (Washington, DC: Office of Science and Technology Policy, Executive Office of the President of the United States, November 1997); A. Sagar and J.P. Holdren, 'Assessing the Global Energy Innovation System: Some Key Issues', *Energy Policy* 30 (2002): 465–9.
37 Bernice Lee, Ilian Iliev and Felix Preston, *Who Owns Our Low Carbon Future? Energy Technologies and Intellectual Property*, Chatham House Report, September 2009.