



## The prey of uncertainty: Climate change as opportunity\*

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### abstract

In this article I describe the post-Copenhagen moment in carbon markets and climate politics as one characterised by deep uncertainty. Uncertainty describes the social experience of emerging climate policy, but it is also business strategy. Uncertainty is necessary for markets to function. To understand this, I look toward practices of capitalism, which produce the future as indeterminate. Uncertainty is generated by business practices of treating conventions – rules and institutions, but also social conventions such as people’s ‘green’ expectations – in terms of their material opportunities. Treating conventions as always open to negotiation requires an ambitious or speculative ethos. Rather than projecting a stable vision of reality, nature or truth, these practitioners constantly ask, *what can we do with these possibilities?* I project that the near future will involve a proliferation of low-value, nontransparent carbon markets without any binding global cap on emissions.

### Introduction

The establishment of global carbon markets by regulatory fiat would mark the triumph of financial hegemony over the politics of climate change risk. Climate finance practitioners have first multiplied in numbers in the speculative lead-up to Copenhagen’s COP15 and then spectacularly retreated to the wings to wait again for the signs of easy short-term profit, an ebb and flow marking new high tide for what Christian Marazzi (2010) has called the ‘violence of financial capitalism’. Even so, the theme for 2010 was how carbon markets might still be a basis for accumulation in the absence of a global market organised around a comprehensive UN agreement.

It has become apparent that a major effect of the United States’ re-engagement with the UN process has been to radically disorganise the agenda established under the Bali road map in 2007. The acknowledgement of the Copenhagen Accord by the conference of parties in 2009 served to substantiate the parallel, non-UN negotiating process organised around the Major Economies Forum in which the US holds a much better

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\* I would like to express my gratitude to Michael K. Dorsey of Dartmouth College, Steffen Böhm in his capacity of editor of the special issue, and the insightful and very useful comments of two anonymous reviewers. The paper is much better for their input; the remaining errors are my own. The Climate Justice Research Project is funded by the Ford Foundation.

negotiating position. By the end of the UN meetings in Cancún in 2010, major elements of the US approach to negotiating a weak agreement had been incorporated in the agreed-upon text, and the extension of Kyoto after 2012 had been nearly killed through the work of Canada, Japan and Russia. As Martin Khor (2011) of the South Centre has put it, ‘we now see quite unbelievably an attempt to dismantle even the weaker regime that we now have’. Perhaps most importantly, Kyoto’s organising force as a binding legal agreement based on common but differentiated responsibilities – ultimately on the historical liability of industrialised countries – has been jettisoned.

The increasingly significant language of a bottom-up process, of a politically binding versus legally binding agreement, or of plural institutions signifies to carbon market makers that they cannot simply expect the world’s governments to hand them a global market, ready-made as it were, as the basis for a coherent plan to deal with climate change. Put differently, their ability to define climate policy for their own ends had been called into question.

The disappointment is aptly demonstrated by Richard Sandor, who has sold his stakes in three climate exchanges for about \$600 million, as ClimateWire reports, ‘in light of the roller-coaster ride that now defines climate politics and carbon markets’ (Kirkland, 2010). But disappointment at the rise of ‘regulatory uncertainty’ masks – or perhaps mimics – a deeper problematic of uncertainty at the heart of market mechanisms invoked to confront climate change. Sandor has been a speculator of the first order who staked his own fortunes on carbon market ambition. Moreover, persistent questions about the integrity of Sandor’s approach dogged especially his now-defunct Chicago Climate Exchange. I want to foreground the role of uncertainty in these diverse configurations – ambition, speculation, integrity. These multiple, overlapping modes of uncertainty interact with and compound each other at the heart of the financialisation of climate change, which hinges on volatility and systemic play.

This ‘roller-coaster ride’ of climate politics and carbon markets demands attention, but not only because carbon markets pose a tremendous number of problems for which there may not be any solutions. Sandor notwithstanding, the view from anthropology helps to demonstrate that uncertainty is more than a set of problems needing to be fixed. There are important lessons to be learned for wagering the future of the planet on the promises and practices of speculation. Uncertainty is at the basis of the market perspective itself, especially in its understanding of ‘nature’ as always open to manipulation. Marilyn Strathern (1992: 142) argues that a transformation of Euro-American views of nature has accompanied late capitalism by calling attention to the rise of England’s ambitious ‘plasti-class’, for whom everything is open to negotiation.<sup>1</sup> If, through carbon markets, the atmosphere is becoming an object of management, then this must be understood in terms of the production of uncertainty as a matter of climate opportunism. Following an earlier formulation of Strathern’s, I argue that market ambition relies on a manner of treating rules as artifacts, that is, as ‘things’ that can be worked on, manipulated or ‘followed’ in the sense of following an opportunity rather than fulfilling a requirement. The rules in question are the rules of carbon market policy, including accounting provisions, which become media for new market relations.

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1 For the US context, see Martin (1995).

The opportunism of putting diverse relationships to work – including market relationships meant to do the work of regulating the climate – makes a future that is indeterminate.

The financial community, in the wake of the Copenhagen agreement, has begun to reassess its own expectations. ‘Right now the word is uncertainty’, a senior manager at one of the world’s largest banks recently told a workshop of about 40 climate change and finance experts.<sup>2</sup> In spite of a wealth of diverse concerns at this meeting of minds in Washington, DC, his argument for the day was to take to task the inability of regulators to provide the conditions in which market necessities would define climate policy. ‘What little forward curve there is beyond 2012 has no liquidity because of regulatory uncertainty’, he insisted. It is insufficient to view this statement only as a statement of fact. It is a speech act in the sense that it is vocalised from a specific perspective in order to achieve certain objectives. It resonates with disappointment, optimism, and ambition, each of which marks this man’s relation to the uncertainties he faces as a market actor. In the act, it attempts to define climate change as a problem in terms of the needs of markets. It is a gamble. Not everyone present buys it. Hence, not only does he speak of uncertainty, but his voice also resonates with uncertainty: nobody knows what will happen after 2012. Copenhagen was a failure from our perspective. We are pressuring regulators to come to a decision. We cannot invest until they do, but we do not know if they are able to.

By way of contrast, those who champion climate justice as the basis for a climate agreement often have little patience with the demand for ‘incentivising’ polluters’ actions through market mechanisms. A precise logic characterises climate justice demands presented at The World People’s Conference of Climate Change and the Rights of Mother Earth in April, 2010, in Cochabamba, Bolivia (see also Bond and Dorsey, 2010). ‘This needs not be confusing’, writes one activist. ‘It is simple...50% emission cuts by developed countries – 1990 baseline – No offsets – 1C – 300ppm’. More than a moral position, the logical clarity of many radical demands presents not a politics of risk but a politics of necessity augmented by remarkable demands for new programs of inclusive global democracy. As Anitra Nelson (2010) argues, such claims demonstrate the institutional weakness through which the climate crisis continues to unfold. Global institutions that could constrain polluters do not yet exist. By fiat, the largest polluters have the greatest say in negotiations – as in so many things – while they insist as their prerogative that a host of other political priorities should take precedence.

There is a saturation point concerning uncertainty and climate change. Beyond attempts to deliberately create confusion by undermining climate science, the scientific problem of climate change is almost exclusively a matter of anticipating an uncertain future.

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2 Ethnographic material in this paper comes from a workshop ‘Fraud and Corruption in the Carbon Trading Market’ held at the World Bank Institute in Washington, DC on April, 2010; the COP15 at Copenhagen, Denmark, in December 2009; the COP16 in Cancun, Mexico, in December 2010; and in climate finance events not facilitated by the UN. As per anthropological convention, sources remain anonymous unless comments are already part of the public record. Several quotes come from meetings held under Chatham House rules, which stipulate that comments may not be attributed by name or institutional affiliation.

While scientists have done a remarkable job in radically reducing uncertainties in our understanding of climatic processes, for policy purposes climate models are only models (Edwards, 2010). They are not representations of the future; yet, they still allow decision-making in the present. Action takes place in the ambiguity of anticipation. Yet, like corporate sustainability claims, scenarios are too often taken as matters-of-fact. Climate change focuses geopolitical anxieties surrounding military, population and energy scenarios with much higher degrees of uncertainty than atmospheric models. Knowing that things will change, but not knowing how they will change, requires a speculative attitude, but this attitude is itself dangerous.

At the same time, uncertainty goes to the heart of carbon market mechanisms, which differ from carbon taxes, for instance, because they invite speculative anticipation of the future. Moreover, carbon markets are highly dependent on optimising uncertainty in determining the stringency of the carbon cap, how permits are distributed and how carbon is quantified and monetised, each of which has proven extremely difficult in practice (MacKenzie, 2010; Callon, 2009; Lovell and MacKenzie, 2011). When, finally, the basic principles of the UN negotiations were undermined by the Copenhagen Accord, the saturation point seemed to be reached, and all of its 'hope' appeared retrospectively as so much misplaced expectation. In fact, expectation, like climate science or regulatory enforcement, is easily manipulated. The attempt to plan the climate's future for now has failed. Subsidiary uncertainties proliferate from there.

This paper proceeds in two respects. First, I examine several loci of uncertainty that defined debates at the interface of climate and commercial intervention in the wake of Copenhagen's COP15 in December 2009. Each locus demonstrates the interconnectedness of diverse 'uncertain variables' (Whittington, 2008). For instance, investment in renewable energy technology, on the one hand, depends on carbon market speculation, but not in the way coal-powered utilities think it does. On the other hand, it raises the spectre of geopolitical energy security, which in turn points to problems of military climate anticipation. In the second part, I examine expectations market makers have of climate policy makers as a way to characterise the state of carbon markets after the demise of a program to establish a single global market based on a legally-binding cap on global emissions. Understandably, my objective is not to thoroughly analyse each source or locus of uncertainty but to demonstrate uncertain interconnections from the perspectives of the actors themselves working at a particular moment in climate politics. Reciprocally, the basis for the analysis I present is itself always uncertain. Too often, in trying to understand what is happening, we are left to rely on statements that are very hard to interpret in a straightforward manner. In socio-technical systems (Barry 2001), uncertainty is what is left when facts cannot be taken at face value and system integrity is a constant unknown. Increasingly we find highly articulated strategies for working with uncertainty in practice, rather than simply trying to control it at all costs. Actors I describe are grappling with situations they poorly understand, and the play of uncertainty constitutes their sociological experience. Rather than attempt to eradicate interpretive uncertainty or establish factual reliability at all costs, I try to capture the ambiguities actors themselves are faced with.

## Loci of uncertainty

Carbon markets are meant to give cleaner industries an advantage over dirtier industries by enabling them to earn revenue from reducing their greenhouse gas emissions.<sup>3</sup> From an environmental policy standpoint, the benefit of carbon markets may be seen in comparison with technology-directed environmental regulation, and tax or fee-based systems. Technology-directed regulation mandates which technologies must be used in specific industrial processes, usually by maintaining a list of the cleanest or most advanced technologies available. In contrast, a market-based approach is meant to keep government out of deciding how companies should run their business. Instead it requires emissions measurement, and establishes emissions limits – the so-called ‘cap’ in cap-and-trade – to put a price on those emissions to try to ensure companies will take the requirements seriously. A carbon tax can also be used to put a price on carbon, while a third approach could allow emissions for free up to a certain threshold, and then levy a stiff fine for any emissions over that threshold. In contrast to taxes, markets are meant to let the carbon price fluctuate according to demand by letting emissions reductions be made by those who can do so most cheaply. In contrast to technology-directed approaches, carbon markets are ‘a mode of neoliberal exceptionalism’ (Ong, 2006) meant to keep government out of the details about how specific reductions will be made. As Nikolas Rose (1999) would suggest, carbon markets are a mode of ‘governing freedom’.<sup>4</sup>

It is an oddity of contemporary environmental policy that a primary consideration is for playing on the feelings of polluters.<sup>5</sup> Out of all of these, carbon markets are the only policy instrument meant to make businesses excited about the prospect of lowering their emissions through incentives and other motivational strategies. By giving businesses the option of buying and selling rights to their emissions, it opens up the possibility of speculation. As far as policy theory is concerned, there are two parts to this speculation. If I am a clean company, not only can I make a little money through technical innovation, but I can make that money off of you, my competitor. Correlatively, if I am your competitor whose equipment is old and outdated, then this new aspect of competition appears as a threat. In either case, opportunities and threats refer to market uncertainties, i.e. relationships that cannot be determined precisely in advance (cf. Newell and Paterson, 2010). This uncertainty is integral to the concept of environmental markets; what management theory calls competitive advantage operationalises the price on carbon.

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3 For an overview of carbon markets, see Lohmann (2006) and Bumpus and Liverman (2008).

4 The extensive literature on neoliberalism has detailed governmental prerogatives of relying on market mechanisms, but is much less concerned with the business practices to which they delegate authority. This research attempts to partly fill that gap. It requires a shift from ‘knowledge’ in the governmentality research program toward speculation, ambition and other forms of future-oriented uncertainty. It also helps demonstrate how capitalism poses the future as an irresolvable materialist problem. See Foucault (1991); and for capitalist futures as irresolvable see Polanyi (2001).

5 This inability to say no is an important characteristic, albeit through a different reading, of liberal environmentalism. See Bernstein (2001).

Competition and the uncertainties it entails spill over into global political economy as well (Spash, 2010). A permit or allowance is a government-issued right to emit one metric ton of carbon dioxide, or an equivalent amount of another greenhouse gas, as part of an economy-wide cap set on the total emissions. All permits are issued within a compliance market, meaning that polluters are required to submit the permits in order to comply with regulations; competition is usually among businesses in a single regulatory space and a great deal of ambiguity stems from how that regulatory space is defined. Differently, a carbon offset, also called a credit, represents an ‘equivalent’ amount of actual GHG that was removed from the atmosphere or prevented from being emitted.<sup>6</sup> In fact, it represents a quantification of behaviour leading to that reduction. The credit for that reduction is then sold to allow for increased pollution elsewhere, usually another country, but the ability to use an offset for compliance depends on the regulatory space it is being used in. Indeed, the Clean Development Mechanism (CDM) has created a market for a new resource asset class that is solely meant for the purpose of transferring emissions rights from developing countries to Europe, a fact that raises important equity questions given the legacy of colonialism and the importance of fossil fuel emissions to economic growth (Bachram, 2004). Carbon markets, especially offsets, make rights to emit greenhouse gasses into a ‘natural’ resource asset necessary for economic growth and over which developing countries may in the future need to compete with advanced industrial economies. The EU ETS program already has ‘internal’ characteristics of this with Poland strongly rejecting the competitive demands of a stricter emissions cap (Krukowska, 2010).

Strictly speaking, carbon credits and permits are not commodities but novel assets whose characteristics depend on the intricacies of how they are created, what they are meant to represent, how they are traded and what they can be used for. A permission slip to pollute issued by the government of Denmark is clearly a very different thing than a ton of CO<sub>2</sub> that has been sequestered in a forest in Cambodia, guaranteed by the UN. Carbon markets enable buying and selling these different products through different carbon exchanges or through private arrangements, including derivative contracts. Yet, for now the details of how they are generated and what they may be used for are often more important than the details of how they are traded. Because of the complexity of how the products are generated, how carbon is measured and how they may be used, very specific forms of uncertainty permeate carbon market systems. It is clear that market makers would very much like a ton of carbon to be treated always as a ton of carbon, equivalent in all cases.<sup>7</sup> To treat carbon dioxide as a physical commodity would form the basis for a single global market. But, in spite of claims by Lovell and Liverman (2010) and Bumpus (2011), ‘carbon’ is not a physical commodity even if it includes certain physical parameters. ‘It’ is an assemblage of agreements, conventional practices, durable artifacts and rules held among people who operate in very different

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6 E.g. Bumpus (2011) who, however, in my view is far too concerned with justifying the material basis of offsets technology. See also MacKenzie (2008). In general I find that the actor network theory approach to carbon markets used by Bumpus, MacKenzie and Callon misses or avoids crucial elements of the productivity of ‘optimal’ uncertainty via manipulation of rules, which I try to emphasise in my argument.

7 See, e.g., the somewhat contradictory discussion of why TerraPass does not use forestry projects for their offsets (Stein, 2007).

contexts around the world.<sup>8</sup> Permits are a system of monetised rights. Credits or offsets are a quantified, incentivised change in behaviour. Both take their literalised form as data entries in online government registries. Understanding the contingencies of the assemblage is central to understanding the uncertainties at the core of markets (Collier and Ong, 2008).

## Outsized ambition

Understanding carbon products in terms of the complexity of how they are made and what can be done with them emphasises the strategies of market makers. Because markets are supposed to drive creative innovation, gaming is not only a possibility but actually is necessary for them to function as intended. While there are clear zones of fraud and clear zones of compliance, there is no line separating fraud from compliance or gaming from not gaming. To understand how markets will operate it is necessary to begin to question how market makers work with uncertainty.

Jillian Button (2008: 572) observes that ‘It is becoming obvious that [carbon] market participation will be driven not only by compliance, but also by speculation’. Button’s understatement is a welcome respite in a world of masculine hyperbole. The corporate lobby for climate policy has been especially intense, and only tangentially connected to a clear concern with limiting warming. At a Silicon Valley off-venue side event in Copenhagen a reporter pushed venture capitalist promoters to be clear about why they were talking about climate change when their prerogatives only revolve around high-risk investment in so-called green tech energy technology. Wasn’t this greenwashing, or at least an opportunistic discursive move? That climate change implies changing the entire transportation and energy sectors is the ‘greatest economic opportunity ever’, said Dan Miller of the Rota group and Solazyme, who runs his Mercedes on algae. Mike Fortun (2008) argues that such forward-looking statements hinge on seduction and promise. ‘I want to be the person who stands out in Copenhagen’, Miller said. ‘We all have healthy egos’. Another argued that in Silicon Valley this relationship to risk ‘is in the water’. Such ambition was echoed in a statement by an earlier presenter, who argued for the validity of what Paul Rabinow (2008: 84) has called the agonism of high profile biotech. One grows up wanting to change the world, to start something big. Failure is a necessary part of the process and, acknowledging a degree of arrogance, Silicon Valley has the smartest people in the world – a great many of whom are not Americans, he insisted. ‘I want to try everything and see what works’, said a co-panelist.

Market makers’ explicit commentary on their own ambition helps describe their relation to uncertainty, emergent within institutional and economic milieus. Techniques of manipulating uncertainty constitute economic and environmental actors, and vice-versa. As Caitlin Zaloom has argued:

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8 The best statement of this is Button (2008), who treats carbon as a currency. There is wide variation of views on this question among market practitioners. The clearest demonstration that carbon dioxide is not a physical commodity is that lots of different GHGs are traded as equivalent based on units of ‘carbon dioxide equivalence’ (CO<sub>2</sub>-e), expressed in tons, which is actually an equilibration of the gases’ effect on the warming of the atmosphere. It is the gases’ warming effect that has value, whether operationalised as a permit or a reduction.

[F]or speculators, risk taking does not become routine... Traders come to these markets, hotbeds of profit and loss, to try their skill on the financial high wire... Aggressive risk taking is established and sustained by routinization and bureaucracy; it is not an escape from it. (Zaloom, 2004: 65)

For Zaloom, it implies that market makers would not be the people they are without 'aggressive risk taking'. Risk makes them who they are, over time, through the practices they commit to. Risk is a social fact; market makers produce risk while risk produces market makers. In the context of climate change, trading is an environmental practice meant, in its broad application, to manage climate change not by pursuing predictability but through entrusting climate uncertainties to market uncertainties.<sup>9</sup> It means that markets depend on and are broadly characterised by socio-cultural practices and cannot be reduced to the work of abstract, self-interested market actors. Put differently, market actors always have specific interests, which are historical and socio-cultural (MacKenzie 2006).

## Manipulating futures

Second generation biofuels, such as those proposed by Solazyme, participate in an understanding of nature, not as nonhuman other, but as so many material relationships that can be creatively and perhaps indefinitely manipulated (Thacker, 2004). In this capacity, synthetic biofuels may parallel an emergent tendency in the oil industry itself. In presentations at the climate meetings in Cancún, Shell, BP and Chevron each claimed that climate policy has made it possible for them to forego any projection of peak oil. To be clear, they seem to expect to extract oil from the ground indefinitely, but they no longer find meaningful any scenario exercise that projects a future in which oil runs out. Instead, they lobby for a moderate climate policy that will raise prices at the pump, giving them a higher profit margin supplemented by carbon market revenue. In turn, they expect this to stimulate a shift to higher value but lower volume oil use through higher efficiency vehicles, with oil supplemented by conventional biofuels. Such a situation helps them solve a basic limitation of their business model by dampening the need to discover extensive new oil reserves. Rather, they anticipate indefinite extraction using new technologies and unconventional sources like deep water drilling and tar sands. The rise of new technologies of extraction and refinement has allowed them to redefine the nature of oil; carbon markets as social technology allow them to redefine the nature of demand. As with the creation of synthetic organisms meant to drive second generation biofuels, demand management also requires an ethos of creative, imaginative manipulation of durable relationships.

A major difference, however, is that for managing social relations disinformation serves to directly produce uncertainty. Shell's understanding of climate risk mirrors the strategies of the tobacco industry in defining the safety of a product through a strategic redefinition of scientific practice (Oreskes, 2010). In their presentation at the climate meetings in Cancún, David Hone, Shell's sustainability representative, showed a graph to demonstrate that an average global temperature rise of 2°C would probably not occur

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9 Lohmann (2010) draws a parallel between risk markets and carbon markets, whereas I try to underscore the ways climate uncertainty and market uncertainty are wrapped up in each other.



until the atmospheric concentration of CO<sub>2</sub> reached 650ppm, a number far higher than most estimates (e.g. Stern, 2009). Moreover, it was rendered on the graph without any statements concerning probability assumptions. Finally, another line on the graph indicated his claim that temperature increases as high as 4°C would probably be the upper limit of ‘safe’, and that this would likely occur around 1000ppm. In these highly implausible claims, the reliability of science itself becomes the target of manipulation. In his talk, Hone claimed the modelling was done by MIT ‘incorporating some of Shell’s assumptions’. Even their hedge against being accused of creating disinformation incorporated an ambitious attempt to back their claims with the name of one of the world’s most prestigious research universities. But the issue here is not what Timothy Mitchell (2002) has called the rule of experts. Mitchell’s argument about the authority of expertise implies that truth claims are taken up and believed as a kind of reality effect, yet it is easy enough to call Shell’s claims into question. Statements such as these can be taken to indicate how Shell will act, not what it believes about reality. Nor is it a simple matter of producing ignorance. Shell’s discursive strategy instead serves to disrupt and confuse, to produce uncertainty in otherwise plausible public discourses. No one needs to believe them for the tactic still to work; reciprocally, insisting on the facts, while necessary, can oftentimes miss the point.

Like the Solezyme investors mentioned above, Shell’s approach manipulates truth claims as readily as it does climate policy instruments. It is easy enough to tweak a story about high-risk investment in renewable energy as a brand of green capitalism sensitive to the demands of climate change. Carbon markets similarly enable Shell to strategically redefine their future in terms of indefinite returns on investment not only by manipulating a narrative but also by attempting to rework the structure of consumer demand. This kind of relational expertise calls attention to the ambitious ethos and risk-taking socio-cultural practices that interpret environmental practices as artifactual or conventional relations open to strategic modification. The question is *what may be done with this relationship?* Or, *what can we get away with?*

## Geopolitical gambit

Ambitious repurposing of climate policy has also led to a new global geopolitics of renewable energy. The German minister of environment, Norbert Röttgen, insisted in Copenhagen that protecting old industries was not the point of carbon markets or a global climate regime. Rather climate regulation must be viewed as an opportunity for dominating new energy markets bolstered by global intellectual property rights. In competition with China, India and the US, Germany holds 16% of global clean tech trade (CleanTech Group LLC, 2010), a frontrunner for whom ambitious global targets mean not only reduced costs of emissions reductions but also global control of new materials and technologies, expanded market share and consolidation of intellectual property ownership. That these issues now pertain to control of the global energy supply has only partly been anticipated by the dominance of oil drilling and refining by a few huge global players. Diversification of energy through lots of different renewable technologies offers a glimmer of energy democratisation, yet at the same time global warming threatens potentially pervasive energy control. Climate change has become an accumulation strategy but also a matter of energy security. This point is crucial even if

it is often put forward by climate sceptics defending the national interest. Coal, after all, is a matter of energy independence for many countries; and threat, like risk, is a term that encapsulates a problematic of uncertainty. One country's geopolitical gambit is another's potential military threat.

Resulting geopolitical uncertainty is partly why, as Michael Wara (2007) shows, carbon markets will not easily make countries shift to cleaner energy supplies. 'The CDM, no matter what the price of carbon, is unlikely to convince China that it makes more sense to depend on foreign sources of natural gas than on cheaper domestic coal'. Related to the problem of energy path-dependence, Wara's point has policy implications roughly opposite of Röttgen's geopolitical futurism. Wara argues that good climate policy should build 'agreements to share low-carbon technologies as they are developed and a commitment to fostering resilient energy markets and security arrangements'. Founded on a risk-relationship to the future, Röttgen's speculative play implies inherent energy insecurity if countries must choose between domestic coal and foreign energy dependence. In contrast, Wara's argument suggests a hedge against insecurity and prompts a restrained geopolitics.

That climate change is a potential geopolitical security issue is not lost on those for whom climate risks remain paramount. Indeed, it may be possible to view climate change politics as a demand to preserve some semblance of the ecological security otherwise provided by a stable climate. A recent letter to the UN Security Council from the Pacific Small Island Developing Nations argues that

Sea level rise is the most dire security threat to the region. Recent projections by scientists indicate that a rise in sea level of two meters by the end of the century cannot be ruled out. Such a scenario would redraw political borders and devastate low-lying islands in the Pacific. (Islands First, 2010: n.p.)

Islanders' claims articulate the very terms of uncertainty through which changes to Earth's climate are experienced: threat, projection, 'cannot be ruled out', scenario, and finally devastation.

## Twisting rules

Carbon markets can only intensify this strong tension between those who are in a position to 'game' the opportunities of climate change, and those who experience the effects of centuries of open fossil energy extraction as a threat. Let me turn to discuss a Washington, DC, World Bank Institute workshop on fraud and corruption in carbon markets. Part of my objective in describing the flow of interaction at a professional policy workshop is to allow for a description of how multiple overlapping market uncertainties percolate through the work of policy makers grappling with the unknowns of climate change. If market makers play with uncertainty, regulators have a very different affective and professional relationship to how markets function.

Carbon markets from 2009-2011 were rocked by a series of very high profile scams, demonstrating the permeability of markets to ambitious gaming strategies through which some market actors engaged in the fraudulent manipulation of market intricacies.

A very small number of dedicated journalists and activists remain aware that someone must ultimately go to offset projects and try to understand what project developers are doing through time consuming and expensive quasi-enforcement spatial practices. The role of official offsets verifiers, in contrast – the three largest of which have all been suspended at one time or another by the CDM governing board – by now has become suspect not only for their conflicts of interest, but perhaps more basically for the uncertainties at stake in estimating actual reductions.

Debates about these issues easily make anxieties run high. At the DC meeting, a chief auditor indicated that, from his perspective at one of the big four US accounting firms, there is no realistic possibility of performing due diligence in the US for financial assurance for carbon emissions. The methodologies remain fraught with uncertainty. Re-performance tests, in which the same standards are applied by different teams to the same data, have demonstrated unacceptable margins of error. There are standards, he insisted, but not what you would see for financial accounting. In order to monetise carbon you must be able to treat it as closing your books. A Canada-based auditor discussing experience in Alberta told me, ‘they’ll get four qualified auditing companies to re-perform audits on a project, and they’re so far apart they can’t even come to a conclusion’. Asked to address the similar problem of measuring the environmental integrity of international offsets, a US federal environmental crimes officer confirmed that they had no effective way to monitor integrity. At the level of carbon accounting there are no bright lines, the auditor argued, but only large grey areas that must be managed with ‘engineering judgment’, that is, verifiers’ discretion. ‘We don’t even have revenue-grade meters’ – but the carbon being accounted for has immediate financial value, which exponentially raises the stakes of that discretion. ‘The accountants I work with’, he said, himself an engineer, ‘are very uneasy about anything requiring auditors’ judgment, and I have had to explain repeatedly that this is a basic aspect of engineering work’.

‘How does one enforce additionality?’ asked another environmental crimes officer, shifting the debate before anyone was satisfied with its resolution. As a lawyer for a prominent investment firm pointed out, ‘additionality is a fraught concept’. It refers to the process of ensuring that reductions in carbon emissions are due to the policy and not to other factors; it requires that carbon finance is not being mis-spent on projects that are already financially viable. On the one hand, the process is necessary for measuring reductions, while, on the other hand, it is imprecise and subject to manipulation. ‘It may be a bad policy tool but it is not necessarily fraud’, continued the attorney. The accounting concept hinges on narrative, making audit difficult if not impossible. Haya writes, based on interviews with project developers, ‘Validators, tasked with auditing CDM additionality claims, believe that additionality testing procedures are subjective and can be manipulated, with many “knobs you can turn”’ (Haya, 2009: 11). Another financial services advisor described the problem as ‘how do I know this investment wouldn’t happen under business as usual? Additionality requires creating a hypothetical view of the world’. For market makers, the overarching strategy has been to do away with additionality requirements, in a bid to provide more market certainty by increasing climate uncertainty by an unknown and technically immeasurable amount.

The string of stacked-up, related uncertainties here is precisely the point. Unanswered questions beget more questions, a proliferation of similar problems in interconnected fields of practice. From crucial reliance on engineering judgment to the flexibility of standards and the dynamics of different fields of expertise, for billions of dollars of transactions the carbon market turns to rely on a concept that cannot bear much practical emphasis because it involves comparing uncertain measurements with the much less certain estimation of what would have happened in a hypothetical scenario. How would a prosecutor possibly convince a jury beyond reasonable doubt, which is the American legal standard, of criminal intent in such a situation? As a prominent climate lawyer put it to me, ‘making [CDM policy] clearer is good but making it more complicated in order to make it clearer may not work’. Global markets seek to organise this heterogeneity, but they do not tame it. This scenario is what proponents of carbon markets place their trust in.

Complexity and confusion at the level of practice generates the uncertainty necessary for criminal climate fraud. The year 2009 witnessed an explosion of fraud in the carbon markets surrounding three basic strategies. Tax evasion or so-called carousel fraud marked the largest scam in monetary terms. Europol estimated value added tax fraud at about \$7.4 billion in lost revenue (The Guardian, 2009). Perhaps most spectacularly, the Hungarian government found a way to recycle emissions permits that had already been used for European compliance obligations, only for brokers to discover these same permits had resurfaced within European exchanges. Prices collapsed when the news broke and while it turned out that the trades were technically legal, the experience revealed both that Japan was actively allowing companies to submit recycled permits for their voluntary obligations and, more importantly, the European rules allowed for a lucrative form of arbitrage whereby the more valuable EUAs (EU emission allowances) could be recycled provided an equivalent number of the national units, AAUs, were taken out of circulation. Lastly, a phishing scam in which registry accounts were hacked and allowances stolen, then sold back into the market, created a situation in which buyers had no way of knowing whether they held stolen property in their accounts. The spot market closed for three weeks to accommodate the situation, while the European Commission created a new directive such that the account holder of a carbon permit would be held to be the legal owner regardless of the means by which the permits were obtained (European Commission, 2011). Such strategies involve cunning repurposing of the rules or technical opportunities to be exploited. The world’s largest carbon finance institution, Barclays Capital, has called for tighter regulation of European spot markets in carbon because the fraud ‘feed[s] suspicions about the reliability’ of those markets (Carbon Finance, 2010b: 9). This is probably not what RWE climate officer Ludwig Kons meant when he said that carbon markets had ‘awakened the world’s technical imagination’ (Klawitter 2010). As Friends of the Earth (2010) suggests, markets, too, are technical devices subject to ingenious play.

When proposals for market-based solutions are offered up within policy debates, it is rarely appreciated that markets rely on social and cultural practices, which implicate ways of thinking and ethical and political values. Imagine the ethos of commercial practice for this apparently legal game. Summit Energy (n.d.) consulting offers the following description of one of their client services:

In some countries the purchase of ‘green electricity’ (which is brown electricity covered by an equal amount of RECS [renewable energy credits]), leads to a tax reduction. For more than 50 clients we purchased RECS at a cost lower than the tax reduction itself, creating a net benefit of about 1€/MWh and generating savings up to €100,000. A number of clients have also elected to use their ‘green energy purchase’ in marketing strategies.

In other words, companies may receive a tax reduction for buying credits but the reduction is more than the price of the credits, giving everyone involved a healthy subsidy courtesy of European taxpayers. The Kentucky, USA, based consulting firm is suitably forthright about what constitutes green energy as well as how it can play into green marketing campaigns.

Broadly speaking, carbon criminality takes two forms, one related to defrauding markets and another, which directly undermines environmental integrity. While VAT fraud and phishing are nothing new, many of the crimes bear directly on the environmental aspect of cheating the emissions reductions associated with carbon trading, especially concerning forestry offsets and voluntary markets. Arrests for bribery of government officials to secure offset projects belie claims that ‘None of these [fraud] issues have actually increased the number of credits in the carbon markets’.<sup>10</sup> *The Financial Times* reports arrests of a London man in connection with plans to pay Liberian officials \$2.5m for a 400,000 hectare land concession which expected to generate \$2.2b from the sale of offsets (Peel and Harvey, 2010). The nearly thousandfold difference between illegal payments and expected sales reinscribed classic patterns of resource accumulation and, according to Global Witness, the deal also left the Liberian government liable for any offsets shortfalls. It is a risk sharing agreement any investor could get behind. Further questions remain about the permanence of forestry offsets when deals such as this rely on temporary concessions, and about the potential for induced displacements when a full one-fifth of a post-conflict African country’s forests are placed under a privatised conservation concession.

As Global Witness’s Amy Barry noted in their press release, ‘As businesses and governments in developed countries channel “guilt-money” towards developing countries as a way of offsetting their own emissions, the space for carbon-cowboys will open up’ (Global Witness, 2010). Yet, timber industries are notoriously ungovernable, raising a complicated spectre of how exactly a new market in forest offsets will sit atop an industry already saturated with unsolved problems. A climate representative for one of the US’s largest electricity utilities, heavily invested in Amazonian conservation, put it this way: ‘with forestry the issue is not, did I bolt on the new technology, but have I introduced a new livelihood over a tremendous area? Can we trust the local government to protect those people, or do they need some form of non-state protection? NRDC has been a great partner for us. But far flung across the world? The challenges are essentially new’.

The debate at the fraud workshop in DC played out along the lines of whether anyone in the offsets markets has a financial incentive to ensure environmental integrity. Incentives in this case would do the work of self-regulation. But no one at the table could identify any market actors with material interest in insuring the environmental

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10 Olivia Hartridge of Morgan Stanley, quoted in Chestney (2010: 6).

integrity of emissions offsets. ‘Well, there are liability issues’, one participant finally pointed out, explaining that a buyer could sue an originator if the purchased reductions were not real and additional. Why buyers would care or who would pressure them to care remained unanswered – especially once markets go to scale – although one academic hoped that NGOs would play the role of quasi-state enforcement. An environmental crimes officer was more direct. Yes, there are liability issues – they could be put in jail. Climate justice, indeed.

But law enforcement will never manage to contain problems inherent in market design. As an apparent carbon developer put it, ‘Almost every project I encountered was being gamed or defrauded in some way in order to prove additionality. Unorthodox financial engineering, false certificates, false board meeting minutes (a classic technique for “proving” prior consideration), redacted and re-edited feasibility studies, deliberate omission of material information (e.g. PPAs). These were all tools of the trade if the original documents or numbers didn’t “fit” the rules’.<sup>11</sup> The allegations of systemic violations suggest that the United Nation’s carbon market regulator actively colludes with widespread fraud.

## Foreclosed investment

There is no necessary correlation between climate risk and market risk. The two are connected only potentially in the details of climate policy, and those links are tenuous at best. Carbon markets, while promising to tie climate objectives to risk-taking entrepreneurialism, are perhaps more closely aligned with moving around and forestalling investment and innovation. The classic form of this for Europe’s carbon market is the ability of companies to reap windfall profits from the free allocation of carbon permits. But the strategies and consequences of this are often not appreciated.

Summit Energy (n.d.), mentioned above, takes credit for negotiating a €10m carbon credit boon for a Belgian cement manufacturer by selling their carbon permits and relying on cheaper carbon offsets instead. But that is perhaps the most basic strategy for maximizing carbon revenue.

An energy executive for RWE told the crowd at Copenhagen, ‘For countries that rely on coal, until we have CCS [carbon capture and sequestration], the Clean Development Mechanism is our CCS’. CCS for coal has been demonstrated in small-scale prototype projects but the technical and financial hurdles remain vast, especially given the scale needed to confront the issue. Robert Bryce (2010) estimates that, to account for roughly half of US carbon dioxide output, 8.2m tons of CO<sub>2</sub> would need to be stored daily. That logistical problem of scale would be compounded by the geological risk of injecting high pressure CO<sub>2</sub> into geological formations such as depleted oil fields. Yet, what the energy executive seems to have meant is that international offsets are his company’s only hope, or rather that from his position he – as a crucial decision maker – was going

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<sup>11</sup> ‘An insider’s view: Fraud, corruption and environmental integrity of the CDM’ [<http://www.qiqo.info/cdmwforum/index.php/topic,13.0.html>].

to wait out investment in non-fossil fuel energy sources by relying on reductions from developing countries.

The strategy is both spatial and temporal. ‘A responsibly acting company can achieve a lot by acting worldwide and for us this is 100m tons until 2020’, the executive elaborated. The volume indicates not a lack of ambition – 100m tons has a value of about €1.3b at December 2010 prices – but rather where their ambition is directed geographically, and through what spatial strategies, namely the transfer of emissions to Europe from developing countries. Still, the benefits of plucking low-hanging fruit aside, if offsets represent a pressure valve for the carbon price, when exactly will RWE manage to wean itself of its nearly 70% dependence on coal? As long as offsets can be bought and stockpiled, where is the incentive to invest today in risky and uncertain CCS technologies? And is RWE’s increased reliance on nuclear energy, accounting now for 15% of its electricity generation, the only imaginative hope for different energy sources? These are real questions that remain unanswered and hence are integral to the mode of uncertainty characteristic of market-based proposals. *Der Spiegel* calculates that when Germany ceases to distribute permits for free in 2013, the value of RWE’s greenhouse gas emissions will approach €2b in what RWE Chief Executive Jürgen Grossmann calls ‘the dawning of an uncertain future’ for Europe’s largest utility (Jung, 2010).

Part of the issue is the nature of the speech act when an energy executive justifies waiting it out by pushing responsibility onto different times and places, what might more broadly be called strategies of evasion. In the case of heavy industry, the strategy involves lobbying for excessive and bankable carbon permits. Corporate Europe Observatory has recently released an investigative report into the lobbying practices of Arcelor Mittal steel and Lafarge cement, two energy-intensive firms that have benefitted dramatically from the free allowances distributed for the EU emissions market. In these two cases, bluffs, threats and fear tactics result in the over-allocation of permits.

[E]xcessive allocation is not a one off, or a result of the financial crisis. Nor is it a mistake in the design of the early stages of the ETS, but it is in fact a result of the permeability of the system to industry lobbying. (Corporate Europe Observatory, 2010: 3)

Sandbag (2011), a UK-based NGO, has estimated Arcelor Mittal will close 2012 with a surplus of nearly 100m allowances, enabling them either to sell for windfall profits or to further forestall investment in emissions reductions.

Lobbying speech acts are sometimes wildly inaccurate but are de facto valid to the extent that EU MPs and Commissioners accept them as valid. The report documents Arcelor Mittal’s misleading lobbying claims going back to 2006, while Sanjeev Kumar, of E3G, a controversial pro-market environmental think tank recently argued that ‘there is no evidence to back up industry’s scaremongering’ (Harrison, 2010).

Because of this oversupply, carbon prices are far too low to drive investment in renewable technologies. On the one hand, often questionable speech acts are nonetheless taken as institutionally legitimate while, on the other hand, this forecloses the ability of carbon markets to finance investments in the post-fossil fuel economy.

The International Energy Agency (2011) estimates climate investment postponed beyond 2020 will cost 4.3 times investment now. Lobbying practices such as these spatially and temporally displace responsibility away from polluting energy firms, but they also produce uncertainty by distorting the supply of permits via ambitious commercial strategies. We are left with what Ulrich Beck (1999: 149) once called organised irresponsibility now taking the form of systemic procrastination.

As the Copenhagen Accord was being signed, Mindy Lubber, president of Ceres and director of the Investor Network on Climate Risk, wrote in *The Financial Times*, 'Businesses are clamoring for comprehensive national and international policies that provide certainty that all countries are ready to work together to tackle this colossal challenge' (FT Energy Source, 2009). On the heels of massive profits pocketed by the European utilities as 'costs' passed along to consumers, a sort of stimulus package for industrial lobbying, it is no wonder that American conservative populism views climate change as a scam. The wrong people have been clamouring.

## Regulatory disappointment

But the regulatory certainty Mindy Lubber hopes for is no incidental matter. I take references to uncertainty by market makers over the course of 2010 as indicative of a short-term fad emphasising disappointed capital expectations for payouts of the public trust. The Copenhagen agreement failed to establish the legal basis for a market for carbon past 2012; what investors hoped for was a binding agreement to drive an exponential increase in demand. Subsequently, they would be able to more accurately estimate demand for reductions, and hence demand for offsets. On those terms the market would have been relatively calculable; by the same token, the impact on the climate might also have been calculable, albeit with much higher margins of error. On the other hand, finance had expected a major investment of public trust. Considering the collapse of carbon prices in the wake of Copenhagen, the failure of COP15 was a failure in market expectation. We are now living in a world in which carbon markets function normally on much lower demand expectations, in the absence of a binding agreement, and hence a much lower price of carbon. Climate policy now takes the form of a plurality of carbon markets tied to the privatisation of the atmosphere, combined with the absence of legally binding planetary commitments to reduced emissions.

Point Carbon's Arvanitakis (2010) pinpointed the disappointment in Copenhagen as a graphed function of regulatory uncertainty. In a chart labelled 'Copenhagen's impact on certainty and the carbon price', the EU allowance spot price is graphed across the weeks of December 2009, demonstrating in visual form the collapse from 14.5€/ton to nearly 12. Graphically it is impressive, since true to form for a marketing publication the line peaks at the top of the graph and, emphasising its point by manipulating the scale, drops to nearly the very bottom. (For a more responsible representation, the scale should begin at zero, but if it did the price cliff in the graph would look more like a hillock). If the point seems silly, that's because it is silly. Why does business analysis, like green marketing, insist on creative but gimmicky misrepresentation?



Even so, there is no line to graph ‘certainty’, as claimed in the title. Consider the endless talk about ‘Hopenhagen’ propagated by the most commercially invested proponents of a climate deal. Arvanitakis blames the price collapse on regulatory uncertainty, but at the time it was a problem with disappointed speculators.

## Perverse incentives

The question is what, exactly, market makers expect of public institutions. ‘The lack of certainty now on the multipliers to be applied in the future (and the lack of certainty as to when these multipliers will be decided) disincentivizes investments very broadly by spreading fear and uncertainty throughout the market about what kinds of projects [and] where will prove to be sound investments if and when these multipliers are finally applied’ (Carbon Finance, 2010a). The quote is from Kim Carnahan, policy leader on the Kyoto Flexible Mechanisms at the International Emissions Trading Association. Its redundancies – uncertainty referred to three times in a single albeit Byzantine sentence – are disconcerting but not incidental. In a bid to tighten the carbon supply and ensure reductions have integrity, the new rule would require submission of two CER offsets per ton of emissions for compliance. Ms Carnahan’s claim is in fact very simple: the proposed ‘multiplier’ rule makes investors less excited about investing their money. The issue is amplified by Carnahan’s reference to investors being ‘disincentivised’. It is a statement about dampened expectations.

For emissions traders the multiplier rule proposal loomed as a matter of regulatory disappointment, but it was trumped by an assault on carbon credits generated from the destruction of industrial gases. CDM Watch (2010) reports that nitrous oxide and especially HFC-23, at least in some cases, have been produced deliberately for destruction within the CDM. Fred Pearce (2010) in *The New Scientist* reports that should the CDM ban their use, project proponents have threatened to vent HFC-23, which is 11,700 times more potent than carbon dioxide, directly to the atmosphere. It seems to be the clearest case of climate policy having created a powerful lobby, which works to actively prohibit revision of the policy. The European Union wants these industrial gas CERs prohibited and has taken action to exclude them from the EU ETS in lieu of a UN decision. HFC-based offsets make up about half of all CDM offsets that have been issued, and also enjoy a higher rate of submission for compliance purposes. Limiting the supply of CERs in this way renders moot the purpose of the multiplier rule.

The reason industrial gases are so popular, as the watchdog group EIA argues, is that the profit margin for destroying the gas can approach 700%. The rents are quite literally perverse. HFC-23 is a waste gas, but the value of the offsets it generates can exceed the value of the primary product by 2.8-5.6 times (Environmental Investigation Agency, 2010). Stockholm Environment Institute has argued a similar problem has arisen for adipic acid plants, in which production has shifted to dirtier plants during low production periods in order to maximise the value of the destruction of the by-product nitrous oxide (Schneider et al., 2010).

But CDM Watch's own militant technical criticism has produced uncertainty for investors. The development marks a dynamic innovation in activist practice, similar to work by the group International Rivers (Whittington, 2008) that has proven effective at least partly due to the uncertainty it has introduced into the CDM issuance process. CDM Watch hired DNV, the huge Norwegian engineering standards verification organisation which usually works for project developers, to develop an alternative technical methodology for the destruction of HFCs according to criteria so exacting no projects could feasibly comply.<sup>12</sup> The methodology was then submitted to the CDM board in such a way that it was forced to take very seriously the allegations of gaming. The dynamic of uncertainty was integral to the play of events. CDM Watch's submission had an unclear legal status, an issue that remains unresolved, because the NGO had effectively commandeered the official procedure. 'The UN market is "an increasingly dangerous place to do business"', a Barclays Capital analyst argued (Carr and Arlie, 2010). As Bloomberg reported:

'You don't want investors to think they are having the rules changed at the same time as trying to gear up private-sector investment into clean technologies,' [A Deutsche Bank managing director said]. 'It is vital that the regulatory framework of the market has integrity'. (Carr and Arlie, 2010)

Industry lobbyists could have easily argued that, to succeed and prosper, carbon markets must have vital environmental integrity. Instead they insisted on protecting the existing rules regardless of their perverse implications.

Carbon market makers are less and less excited about the prospect of larger than life rents on developing world offset projects. The wager of the largest conservation NGOs has been whether or not the financial sector could be brought on board as an ally against climate change, but by viewing this as a problem of motivation and incentive the debate has never adequately addressed what it will mean for commercial firms to take climate change seriously. All around the world, those planning for climate change are forced to recognise that their economic interests, their political, health and physical well-being are likely to be greatly diminished over the coming decades. Liberal environmentalism (Bernstein, 2001) has failed in the political challenge of dealing with climate change. 'I'm tired of the suggestion that we need to pay companies to do what they should be doing anyway', notes one prominent climate activist. 'Big polluters should pay when they pollute, not be handed giveaways', reads a recent green coalition statement critiquing the Kerry-Lieberman draft legislation (Climate Reality Check, 2010). For dedicated greens it is a perverse suggestion that coal utilities will receive subsidies for new power plants in order to experiment with carbon capture and sequestration, thereby prolonging and even increasing the use of coal, while in turn the captured carbon will be pumped into depleted oil reservoirs to extract remaining oil. The expectation of and demand for more and bigger payouts for the private sector of the industrialised West suggests a kind of blackmail.

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12 DNV's full name is Det Norske Veritas Certification AS. The official documents are available from the UN at <https://cdm.unfccc.int/methodologies/PAMethodologies/revisions/58215>.

## Rules as artifacts

The film noir metaphor of blackmail is not incidental; it extends and perhaps completes the gambling image of the wager, with all attendant emphasis on risk. Not only is the uncertainty systemic, but it constantly shifts emphasis. Are the incentives adequate? If incentives produce speculation, is that speculation normal? Are the right people incentivised? Can the developing countries be properly incentivised? Whose ability to capture rents is legitimate? Will the incentives themselves produce unpredictable results? The question of the rationality of market actors is at stake, but the problem is that market actors are hyper-rational, not as a function of human nature but because markets select for and discipline precisely such a speculative ethos. The climate activist who above argues against incentives, in the meantime, insists on a logical identity. If people should not be emitting greenhouse gases, then they should not be emitting greenhouse gases. Polluters should be punished, not paid. That position treats a rule as something to be followed and enforced, whereas those who advocate for incentives treat rules as to be followed in the sense that one might pursue an opportunity or quarry one's prey.

To pursue an opportunity means it is an open question whether one will make good on the possibility it presents. Similar to the ways engineers put to work the laws of physics, the challenge for market makers is to use rules, to push their limits or to manipulate them in such a way that they become instruments or tools (cf. Riles, 2001: 186-7). It implies a kind of literalism. Marilyn Strathern (1980) argues that in certain cases Westerners are apt to view conventions as artifacts, which I suggest may be understood in one light as viewing rules, institutional procedures and durable, physical artifacts like documents as durable, material relations to be manipulated. In precisely these terms, Clifford Mahlung, then-Chair of the CDM Executive Board, replied to concerns about how it is possible for coal power plants to be financed partly through the Clean Development Mechanism:

We have to judge the projects on their own merit; if they satisfy our rules – our requirements – then we can't do anything about that. We have to register them. I think you're concerned that these are not the type of projects that we would prefer. We might prefer the other ones that are also beneficial to the atmosphere.

Note his very careful hedge concerning which projects benefit the atmosphere. To think in terms of opportunities, threats, speculation and incentives implies a completely different relationship to rules as conventions. For law enforcement the question is 'what does this person think she or he can get away with?' – but this secondary, undervalued perspective is nearly an afterthought for policy makers who place their trust in markets. From the perspective of ambitious speculation the issue is, 'What do these rules enable me to do?' This generates the opportunistic relationship to risk.

## Investment grade certainty

Demands for what Point Carbon has called investment grade certainty reached aspirational proportions in anticipation of an agreement at Cancún. Market makers broadly acknowledged that there would be no overarching legal agreement in the

medium term, and actively considered how and to what extent market makers could proceed otherwise. Was a legal agreement even necessary? Arvanitakis' (2010) analysis of market expectations mentioned above plays on the aforementioned relationship to rules when he writes that the binding nature of the Kyoto Protocol has not led to compliance anyway. Canada's strategy to avoid its legal commitment under Kyoto is to fail to set a national target in the first place, since that legal step is a pre-requisite for establishing the commitment. This is another instance of the subtle manipulation of procedure. 'So for Canada, the protocol is not politically binding and so its legally binding nature does not bite—at worst it may be a little embarrassing to be out of compliance' (Arvanitakis, 2010: 3). In other words, Arvanitakis proposes that a legally binding treaty may not matter that much since no one can enforce it anyway. Aihwa Ong's concept of neoliberalism as exception (2006) here takes the form of treating legal obligations as guidelines, at least for this elect class of polluters.

One way forward in the absence of a binding regime is that national reductions could be linked to the Copenhagen Accord through so-called 'nationally appropriate mitigation activities' (NAMAs), giving them domestic legal form for investment purposes without making them internationally legally binding (UNEP Risø Centre, 2009). This scenario implies that 'investment grade certainty' would produce conditions for investment only in relatively inexpensive offset projects, with ensured returns at low prices requiring developing country governments to pick up significant investment risks. Driven only by rents, not by stringent compliance demand, markets would be limited to investment in low hanging fruit.

In addition to the dominant role of markets outlined in the UN High-Level Advisory Group of Climate Financing, market makers have placed their hopes in 'procedural' revisions that would change the details of how markets operate. Calls for standardised baselines in the CDM would shift responsibility for proving additionality and measurement of reductions onto developing country governments, effectively shifting the scales (Smith, 1995) at which the most controversial aspects of the CDM operate. Most importantly, this way of guaranteeing efficiency would also virtually indemnify international CDM investors against activism and legal action, since matters of compliance would likely be determined by domestic courts rather than international standards.

Taking into consideration the likelihood that a two track UNFCCC system will remain stagnant in place, the idea is to forego a relatively calculable price regime based on binding commitments in favour of a plurality of regimes which support weak demand for low-value offsets. The value of carbon products is a function of demand, i.e. the legally binding cap, but that cap would be either very weak or largely left open for future determination. The political status of the agreement is now more substantial than the pledge and review arrangement at the heart of the Copenhagen Accord, but binding global emission limits, not to mention equitable distribution of atmospheric space or the decisive demands for ambitious targets at the People's Summit in Cochabamba, are essentially foregone.

## Conclusion

The energy bases of virtually all contemporary economic practice have undermined the stability of the climate system, creating new opportunities for what Theresa MacPhail (2010) calls strategic uncertainty. Our knowledge about climate change has called into question the relative predictability of industrial economics and presumed linearity of growth at a time when economics has been at a loss to explain or predict the volatility of the financial system. The risk politics of the 1980s and 1990s is only a scant harbinger of the political challenge climate change poses (Beck, 1999; Callon et al., 2009). Climate change involves a program of rethinking the economic basis of contemporary global society. In effect, climate change is forcing economic practitioners to more fully inhabit the world they have created and, improbably, it is through markets that this is meant to happen. Yet, the emphasis on uncertainty highlights both the immense, unstable complexity of carbon markets and the need for a renewed public involvement in addressing responsibility for climate change. Carbon market proposals have ignored the specific climate justice issues stemming from historical responsibility, risk and vulnerability due to a changing climate, and the historical inequalities of wealth, power and environmental disenfranchisement. Beyond criticism of markets, addressing these problems will be essential to establishing robust and creative climate solutions. There are many as-yet untapped, but not particularly profitable, climate opportunities.

This paper has emphasised systemic uncertainties brought into play through the emergence of carbon markets as the primary technical device for managing greenhouse gas emissions. I have highlighted climate policy in a dynamic, creative moment that is deeply political insofar as it attempts to adjudicate the conditions in which people will live in the near- to medium-term future. I offer less a theory of uncertainty than what I hope is a window into a way of viewing the world that is integral to the very real material uncertainties climate change presents the planet. The view depends on the specific practices and promises of carbon markets, and I have focused on market ambition, the geopolitical push to control new energy technologies, the ability to manipulate scientific discourses, low-end fraud in carbon markets, problems with investment and lobbying, and the role of incentives in markets. I have emphasised market makers' expectations with an anthropological view to demonstrate the importance of uncertainty for relationships that may be creatively manipulated in practice. Finally, I have raised one possibility for investor strategy going into the next round of UNFCCC negotiations, namely the push for policy certainty that would ensure weak demand for offsets without requiring a binding commitment to deal with climate change.

It is not hard to assert with confidence that the people who will suffer the most from climate change are already the world's most marginalised (Roberts and Parks, 2007). But this claim glosses as much as it reveals because in reality what that suffering may entail is a mass of unknowns. The uncertainties faced by the people who will bear the brunt of the ecological effects of climate change are overwhelming. For the people facing desertification, loss of water resources or unpredictable extreme weather events, the uncertainty not only points toward the anxiety of vital exposure (Collier and Lakoff, 2008) but also constantly undermines any possibility for planning, for investing in lives

and families, indeed in any normal social and economic activity. The idea that these uncertain futures have less economic value than those of financial capitalism is an irresponsible excuse. These conditions of uncertainty require preparedness and resiliency measures combined with rapid reductions in greenhouse gases. Most importantly, those most affected by climate change must be thoroughly integrated into the emerging public institutions and decision-making processes through which they will be able to advocate successfully for themselves. It is a matter of whose uncertain futures are given priority.

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