



The commensurability of carbon

Making value and money of climate change

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The introduction of the Kyoto Protocol is an attempt to save the climate through a number of schemes, or mechanisms, that commodify carbon. Among other things, these schemes create monetary incentives to reduce carbon emissions through the trade of permits and credits, and they make carbon an object of financial speculation. Most controversial is apparently the potential of carbon thus to be a universal yardstick for value by commensurating moral spheres of human action (the environment, the economy, development, etc.) that some people regard as distinct. This paper explores the consequences of the speculative aspects of carbon as a standard of value and as potential currency.

Keywords: carbon, value, economy, environment, commensurability, commodification

There are today several initiatives proposed as solutions to human-induced climate change. The majority of these are market-based and rely on the objectification of carbon as a kind of commodity that can be exchanged or traded in the form of permits or credits meant to offset carbon emissions. But the global market for carbon involves a plethora of differing interests, contradictions, and tensions; clashes of value, values, and valuations are intrinsic to its contemporary setup. Some argue that carbon trade can help develop the Global South as well as save the climate. Opponents find that it is “carbon colonialism” (Blok 2010: 18), lacks attention to grassroots’ lives, and provides incentives for industry to keep on polluting rather than to shift to green, sustainable technologies (e.g., Lohmann 2010; McMichael 2009b). The objectification of carbon through its incorporation into a market economy entails a long range of interesting questions pertaining to value: What kind of commodity are we talking about? Under what forms or conditions is this commodity produced or consumed? What is the relationship between the value of carbon circulating naturally and the value of carbon circulating as a commodity subject to private ownership? And how can one own “air” in the first place—if that is indeed what is owned?

This article is an attempt to make sense of the value of carbon as it is entangled in these different spheres of natural or social circulation as well as different moral, political, and economic discourses stemming from climate change. A lot of what social scientists are currently writing about carbon and climate change is inspired by Bruno Latour (e.g., 2004) and similar approaches of actor-network theory (ANT) or science and technology studies to politics and agency (e.g., Callon 2009; MacKenzie 2009; Blok 2011). These approaches have proven their worth in pointing out in particular how the political, the market, and the ecological are reconfigured and are reconfiguring each other in public debate, and how different human and non-human actors and agents are engaged in complex infrastructures and networks of interaction to make carbon what it is. Their analyses have inspired this article and especially how carbon can be taken seriously as an empirical phenomenon that involves different meanings across different relationships and contexts. ANT approaches thus form a background to this piece, and they also allow me to draw on material from the empirical cases they examine. Yet, rather than engage this work theoretically, I will follow Latour (2005) and subscribe to ANT as a method to understand how conflicts over the interpretations and definitions of value are engendered by the objectification of carbon.¹ Latour's approach has as its starting point that the social must be considered "flat" (2005: 165–72), so it seems perhaps counterintuitive to fuse it with anthropological theories about value, where demonstrations of how social life can be divided into separate spheres have been very influential (e.g., Bohannan 1959; Parry and Bloch 1989). However, these theories are exactly based on ethnographic work in showing how differences between spheres are constructed and maintained. It is in this capacity that they give a good vantage point from which to discuss the contemporary controversies surrounding the objectification and commodification of carbon as the carbon credit enables the commensuration of all forms of emissions, which implicates all forms of human action under a dominating valuation.

First, I go through the different forms through which carbon is objectified and made transactable, including the institutional framework provided by the mechanisms of the Kyoto Protocol. Then, I discuss how carbon gains value, and how carbon by connecting different actions creates commensurability across what opponents to carbon trade regard as different and mutually excluding spheres otherwise based on different value systems. Finally, I discuss the problem of carbon value in relation to the temporality of offsets, as well as carbon's potential as a durable currency that is material and immaterial at the same time. The ethnography, which I debate here, is the financial and political discourses, where carbon as an empirical term is objectified, and how carbon in these cases enables

1. One reviewer thought that I took a rather narrow view of ANT, but I prefer to demonstrate my perspective by generating analysis and theorization based on ethnography, and thus "do ANT," rather than I would make references to ANT theory, which would be a rather anti-ANT thing to do. By following carbon as a concept and as a substance with the potential to disrupt established conceptions of value, I try to take ANT more seriously than if I were to theoretically follow the ANT literature. It is of course a contentious point whether ANT can be considered a theory, an actor, or something else entirely (see Latour 2005; Gad and Jensen 2010), but that discussion is beyond the scope of this article.

the commensuration of vastly different human practices. I further illustrate how carbon is part of a moral consumer economy with reference to market campaigns from the transport sector in Denmark. Much of what pertains to carbon has yet to be addressed in anthropology, so apart from inspiration from ANT scholarship, the bulk of the literature informing this article comes from human geography, sociology, development, and environmental studies—including the activist sector, which some scholars have used as a position from which to deliver strong yet very insightful critiques (see especially Lohmann 2008, 2009, 2010).

Following carbon

The term “carbon” can carry different meanings in different contexts, and a brief overview may be in order. Everyone agrees that carbon trading is enormously complicated politically, institutionally, and technically, because of the global scale at which it must be implemented to work effectively, and because of the number of different disciplines and forms of expertise that are involved. Carbon trading has, for instance, been characterized as involving a “clash of the eco-sciences”—ecology and economics (Blok 2011: 453; cf. Latour 2004). The ensuing complexity is probably a cause for the imprecision and sometimes confusion regarding what is referred to by “carbon.”

Economists have tended to see carbon emissions as an externality to production (Spash 2010), but with the new forms of valuation, carbon has been brought into the economy and is talked about as a commodity in itself. Of course, carbon was in a way already valued as a commodity before climate change became an issue. Hydrocarbons have been the foundation of the development of the modern world, first in the form of coal and more lately as oil and gas (see Mitchell 2009; Bridge 2010). Carbon has different physical properties depending on the form it takes. In its pure form as an element, it is mostly known as diamond or graphite. It also creates compounds with other elements to be the basic building block of organic life forms and to be the main ingredient in fossil fuels. In these compounds, it moves between various solid or liquid states joined typically with hydrogen and oxygen, and exists in gaseous form typically as methane (CH₄) or carbon dioxide (CO₂). However, following the objectification of carbon as the main (natural) villain behind global warming, it has become a commodity in a global market in a financial form supposed to represent the primarily carbon-based compound forms known as greenhouse gases.

While fossil fuels have been traded *materially*, carbon appears in this most recent commodity form rather as a kind of *intangible* or intellectual property, because what is traded is the right to produce or consume carbon via emissions rather than the carbon itself. Carbon is thus not an object or a commodity that is produced or consumed in any classical sense. As a basic element, carbon itself is really constant in nature, and instead this commodification refers to the physical transformation from one form to another—typically fossil fuel to greenhouse gas. While carbon in atmospheric compounds (as emissions) is furthermore thought about as *immaterial* and as air by the layperson, to the scientist carbon is both tangible and material in all forms. It is the distinction between solid, liquid, and gaseous that makes the difference. The carbon credits and carbon permits are thus ideally directly rooted in the *material* fluctuation of carbon between relatively immobile storage in natural deposits and circulation in the atmosphere, which

exacerbates global warming. It is the enclosure of these carbon stocks that must be assessed and certified in order for carbon to be a commodity subject to private ownership (Bridge 2010). Carbon is thus implicated both materially and immaterially in distinct spheres of value. It can here be seen as metaphor and as a figure for several different forms of circulation—most importantly, economic and natural (life)—and as a circulating object, carbon is also implicated in the very transgression of spheres.

As an objectified entity, carbon enables comparability and even commensurability between different forms of life and different actions across spheres. Commensuration is the process that transforms different qualities into a common metric (Espeland and Stevens 1998: 314). In this case, the metric is carbon, and while carbon is recognized as a universal standard for organic life, I will argue that it is also becoming a universal standard socioeconomically speaking by being a way to put a price on human actions, which all emit carbon.² Carbon is valued not only economically but also morally—for instance, through terms such as “the carbon footprint” as a popularized response to the scientific and financial debates. Moral value is assigned to everyday acts of consumption by measuring them against each other via carbon. Low carbon emission, such as cycling, is good—high carbon emission, such as driving your car, is bad. Now we can also measure how bad these acts are, and one positive action is believed to replace or offset a negative one, as if everyday actions made up a zero-sum game, or as if carbon trading were an adequate shadow or mirror of the “real” economy that consumes fossil fuel.

It is CO₂ that forms the baseline of the effect carbon may have on the climate, and commensuration between the different greenhouse gases is calculated in what is termed “carbon equivalents,” even for those gases not containing any carbon (e.g., MacKenzie 2009). But CO₂ is merely one of several appearances and thus one of several objectifications of carbon. Offsets, permits, and credits may appear to refer to the same thing when it comes to emissions trading on the market, but outside the market, they refer to many different processes, actions, and contexts.

The market construction is a result of the 1997 Kyoto Protocol (UNFCCC 1998), which sets up a framework to alleviate global warming by reducing greenhouse gas emissions. While Kyoto laid the groundwork for carbon in its financial form, the debate about global warming contributes to carbon’s social form. However, there is a wide span in conceptualizations, from the debates about climate change and carbon accounting in scientific communities to the choices of lay consumers talking about carbon or CO₂ emissions as a result of individual actions, which must be offset, and further to the details of permits (handed out by governments) and credits (earned through certified reductions of emissions) that can be traded or sold. In everyday discourse, the term “carbon” has almost become a catchall for all the different forms of chemical compounds and greenhouse gas emissions.

2. Non-human actions may also emit carbon, of course. The distinctions that are drawn between human and non-human in terms of defining the agency behind emissions would be worth exploring as one of the problems engendered by the objectification of carbon. However, as carbon markets are based on the delimitation of human emissions, I only briefly touch on the non-human in this article.

The Kyoto mechanisms

Before I get any further, let me outline the background and formal framework behind the financial valuation of carbon. In order to reduce the accumulation of greenhouse gases in the atmosphere, the international community adopted the Kyoto Protocol under the UN Framework Convention on Climate Change in 1997, and it came into force in 2005. In 2010, 191 states had ratified the protocol, with the United States as a notable exception. In the protocol, the so-called Annex 1 countries (the thirty-seven signatories that are industrialized countries) agreed to reduce the emissions of six specific greenhouse gases, and to do this the protocol set up three so-called flexible mechanisms.³

First, the joint implementation mechanism sets up projects that will reduce emissions in other countries. Thus, Annex 1 countries can earn emission reduction units from an emission reduction or an emission removal project in another country. Then, the clean development mechanism (CDM) sets up the possibility for Annex 1 countries to earn carbon credits in developing countries also via projects. Developing countries have no restrictions on emissions, but through selling carbon credits, it is argued that they will have incentives to turn toward green and carbon-free energy or emission reduction projects, which will generate certified emission reductions. Finally, the protocol allows for emissions trading—in other words, a market for carbon. This is supposed to work through cap and trade, where governments put a cap or limit on what each industrial actor is allowed to emit measured in carbon permits (with one permit or credit set as the emission of one metric ton of CO₂ equivalent). Companies that exceed their limit may purchase additional credits or permits from those who do not meet their limits and have some to spare (see also Lohmann 2010).

The agreement is quite elaborate and demanding in terms of requirements that include technical, scientific, and legal knowledge, and I will not go into detail about the expert systems of calculations and accounting behind it. Suffice it to say that these systems—as pointed out in this issue by Horacio Ortiz for the financial discourses he analyzes—are not merely technical but rely on specific assumptions relative to political and moral considerations; for example, the role of certifications promises to be a fascinating supplement to Anna Tsing's attention in this issue to sorting and assessments that enable commodification yet that also have gift-based sociality in mind. Even if such a focus is not the main purpose of this article, my analysis does hint at similar alternating logics of gift and commodity exchange if one follows carbon through a commodity chain with the different forms it takes, from natural resource through fossil fuel to greenhouse gas emission covered by a carbon permit. However, rather than follow just one of the commodity chains, I prefer to give a brief outline of how value based on carbon is made transactable in three different schemes stemming from the Kyoto Protocol: first, as a commodity on financial markets; second, in the development sector; and third, through voluntary offsets purchased by individuals. These are the main exchanges organized around carbon, and they problematize the value of carbon-emitting actions by aligning and commensurating different spheres and settings where carbon circulates.

3. For details about the Kyoto Protocol, see the UNFCCC's publication (1998).

“Green” market solutions

Establishing a market for carbon has been one of the key ingredients in its commodification, and this process has involved both a market for offsets as well as the introduction of carbon credits into the financial markets along with other commodities. Only a few years back, the *New York Times* quoted a financial trader saying that “carbon will be the world’s biggest commodity market, and it could become the world’s biggest market overall” (Kanter 2007). This was after EU countries had agreed to put a cap on the amount of greenhouse gas that could be emitted in the European Union. When the anti-carbon dioxide stance started to gain pace, the debate had been about whether climate change as a problem could be solved via taxation on carbon (see Braun 2009). Some governments (e.g., Australia) still pursue this. Industry, however, is typically strongly opposed to taxation, because it imposes unfair imbalances on global competition if not all countries impose similar taxes. Thus, the agreement reached through the Kyoto Protocol was to strive toward a market-driven solution. This has involved agreements between governments on caps or limits put on emissions—typically within entities such as the European Union. Permits are given (or sold) to those that depend on the emission of carbon or other greenhouse gases (typically the transport sector, energy sector, and industrial production). These actors then have the option of selling or trading excess permits, and for those in need of more space within the cap, more credits can be purchased. If one does not reach the cap, one can sell a permit to someone who will need to exceed it or who will profit from exceeding it. The idea is that exceeding the cap without permits will be more costly than it will be to purchase permits or credits from others, and that savings or reductions in carbon emissions then will take place where it will be cheapest to cut down. Thus, as with everything else on the market, the idea is that extra or sellable permits or credits can be produced by storing or saving carbon where it is most cost-efficient, and that the excess permits and credits can be sold to industries that then do not have to reduce emissions to stay below a cap (see also Fiske 2009; Lohmann 2010).

There have been numerous criticisms of this system. Most significantly, the permits and credits may gain their own lives as financial commodities, and critics often ask how or whether they refer to any “real” carbon or any “real” offset once they are brought into existence (e.g., Lohmann 2008), or whether the climate comes to rest on the actions and values of financial traders like those analyzed by Horacio Ortiz in this issue.

The European Union’s cap-and-trade and quota system does put in place a political and institutional framework that ideally should enable reductions if the cap is gradually reduced, but the European Union has been overly generous in handing out permits, with the result that permits are so cheap that they have undermined the market (see Stonington 2013). Already, in the first couple of years after introducing cap and trade, the amounts of CO₂ emitted actually increased within the European Union (Spash 2010: 171). There are also several examples of alleged carbon-reducing projects that were poorly conceived, such as Chinese factories that earned money from being given carbon credits in return for destroying the greenhouse gas HFC-23, which was a by-product of the production of another greenhouse gas (HCFC-22) used as a refrigerant. This industry could produce HCFC-22 that was cheaper than a carbon credit was worth on the market,

and they thus financed the production of one greenhouse gas by its own destruction (MacKenzie 2009).

Along with the concern that climate change hits the poor in Third World countries harder than it hits those in the wealthy West, the mentioned loopholes in the system of emissions trading are among the factors having led to criticism that the idea of a green market merely recycles the problem (the way the market is structured) as a solution (McMichael 2009b: 248). While some scholars argue for better market designs (MacKenzie 2009), a counterargument has been that emissions trading commodifies the ecological commons while continuing the reliance on and over-consumption of fossil energy, which is the likely reason that climate change is happening. Because the market is based on constant expansion and exploitation of resources, yet takes place in a finite world, a green market solution is a contradiction in terms (McMichael 2009b). Critics of cap and trade and of the introduction of carbon into the financial markets thus argue that the whole capitalist system needs reform (e.g., Storm 2009; Lohmann 2010).⁴

Development and REDD

It is not only Western corporations and the finance market that have mobilized over carbon—the idea that carbon emissions must be curbed is increasingly exported to the Global South. Based on the Kyoto mechanisms, there are several schemes that have emerged to help reduce emissions in the developing world, even though the Global South was originally left unimpeded by emission targets. As with cap and trade, the rationale was that reduction of emissions would be cheaper to facilitate in the South (McMichael 2009b: 250–51). One of the main initiatives for this is REDD (reducing emissions from deforestation and forest degradation), which is a largely UN-driven scheme meant to ensure that carbon remains stored in forests in the Global South by paying forest owners in the developing countries not to log their woods.⁵

A variety of agents with many different agendas have embraced the commodification of carbon, because they see an advantage to using it environmentally, economically, or symbolically. In this way, different agents can work in apparent unison despite differing, partial, and sometimes confused perspectives on what carbon value entails (see Lovell and Liverman 2010: 270–71). An example is nature NGOs concerned with biodiversity rather than with carbon as such (e.g., Spash 2010: 186), or those who want REDD but do not care much for indigenous peoples' rights (Lohmann 2009: 1068). There are organizations and groups that want REDD to be a way to achieve reductions in poverty (e.g., the World Bank and UNDP), while business investors or local or national elites with an interest in developing land for industry or agribusiness see the carbon schemes as an opportunity to make land reforms. The construction of climate policy and the governance of carbon markets depend on the control of carbon stocks through

4. The NGO sector is likewise divided between those trying to convert the market from the inside (e.g., the WWF, which I will return to below) and those critical of the market (e.g., Carbon Trade Watch and REDD-Monitor.org).

5. An offspring of this is REDD+, which focuses on carbon enhancement of forest stocks rather than on merely leaving forests untouched.

the transformation of forests and other landscapes into objects of financial speculation and profit and may thus entail the conversion of the commons into private property (Bridge 2010: 824). This could lead to land grabs and alienation of people who enjoy some form of traditional land tenure (cf. McMichael 2009a; Filer 2012).

REDD first and foremost differs from cap and trade in that it is facilitated under the project-based CDM mechanism—that is, setting up carbon reducing projects and earning credits rather than trading permits by facilitating emission reductions in Third World countries.⁶ Primarily, it has been adopted by international organizations, development agencies, and NGOs rather than by private corporations. The UN has its own REDD program with FAO, UNDP, and UNEP as members, and the World Bank is involved in funding projects that aim to alleviate poverty through the introduction of forest reserves. These organizations now argue that REDD-financed initiatives should be facilitated with an eye toward food security and agriculture. In other words, actors in the development industry have jumped onto carbon as a vehicle for them to promote their specific agendas of development, conservation, and the like, either through the market or participatory means.

The aim of REDD is to target the approximately 20 percent of world emissions of carbon that comes from logging and forest use in the Global South. A lot of this is from activities such as swidden agriculture and the collection of firewood as much as from the expansion of people into forests in order to clear land for agriculture to feed a growing world population (e.g., McMichael 2009b). In continuation of this, critics have argued that carbon trade and REDD involves the shifting of responsibility from Western industry and consumers onto the shoulders of the world's poor, and it does so by privileging Northern technological intervention and ignoring indigenous knowledge (McMichael 2009b: 52; Lohmann 2009). One example is a CDM-certified project in India, where farmers were given manually operated treadle water pumps to replace old diesel-driven ones in order to curb the emission of carbon. An Indian newspaper caught on to this as a “poor joke” of Indian farmers “bearing the white man’s burden” (Blok 2010: 20), even though they as individuals emit perhaps ten times less than the average UK citizen. With that example in mind, one can understand critics who argue that what such Western-funded projects really buy is the preservation of one’s own lifestyle with emission reductions by proxy agents. What is happening has been called the valuing of Western “luxury emissions” over Indian “subsistence emissions” (Blok 2011: 467)—hence “carbon colonialism” (Blok 2010: 18).

There are several projects around the world suffering from similar problems, and the facilitation of REDD allows for discussion of what is fair in the global relationship between North and South in terms of responsibility for the climate as much as what positive or negative impacts REDD in itself may entail.

6. The joint implementation mechanism works in a similar way but has mainly consisted of First World countries funding projects in the former Second World.

Voluntary offsets

Finally, I want to mention initiatives aimed at getting individual Western consumers involved through voluntary means, and how carbon has entered discourses on energy as a moral signifier in relation to consumption. As Lohmann (2008: 363) says,

It encourages northern consumers to consider part of their emissions to be simply “unavoidable” rather than as part of a pattern of energy use that can only be tackled through political and social organizing. It conceptualizes global warming primarily through complex calculations of guilt over individual “carbon footprints” rather than, for example, the study of international oil politics or the history of social movements that have achieved structural change of the magnitude required to alleviate global warming.

As an example of this, the energy and transport industry in my native Denmark is frequently advertising how much they cut down on carbon emissions and in particular how the consumer, by choosing to take the train, travel by bus, or enact some other alternative, contributes to saving the climate. For example, in 2010, the regional bus company Midttrafik began using an advertisement campaign called “become [a] world savior” (*bliv verdensredder*). In their pamphlets (Midttrafik 2010a) and on their website (Midttrafik 2010b), they compare different forms of carbon-consuming activities. They argue, for instance, that “driving 10 km in a bus instead of a car saves you as much CO₂ as would have been emitted by frying 70 pieces of toast, or heating 23 dishes in the microwave” (Midttrafik 2010a, my translation) and that “an average Midtjysk [citizen of the Midtjylland region] commuter travels 19.5 km each way. For him or her to go by bus instead of car saves as much CO₂ as would be emitted by making 9,367 cups of coffee or boiling water in your electric kettle for 19 days without stopping” (Midttrafik 2010a, my translation). From the website, one can learn that “if you leave the car and take the bus between your home and your school (40 km for 200 days), you can save about 1 ton of CO₂ per year. In comparison you save 110 kg of CO₂ per year by turning off your TV and other electronic appliances completely, or 210 kg of CO₂ per year by using a line for drying clothes instead of the dryer” (Midttrafik 2010b, my translation).

Such messages are directly involved in subject formation, which creates the “carbon-calculating individual” as a particular scaling of the responsibility for climate change (Bridge 2010: 827–28). Yet, the aim of marketing public transport also evokes the question of commensurability, because of the assumptions it is based on and the forms of social differentiation that it glosses over. First, the most likely audience or target group of this web page seems to be schoolchildren or students. The slogans refer to not using the car, but few children or students go to school via car—let alone have a car. Midttrafik thus fails to differentiate between actively choosing the bus and being forced to choose the bus. This is just one example of how the communication of the carbon discourse can be detached from local social reality. Second, it exemplifies well how numerical comparison makes the action of choosing a specific form of public transportation commensurate with other forms of material consumption, and how the difference equals carbon saved.

For carbon to be a commodity, there needs to be some commensurability between different circuits—not only between the market and nature but also within

nature itself. The above example from Denmark—but also the ones from the other forms of exchange—shows clearly how emissions of carbon are directly compared. They also show how a moral economy and discourse is starting to develop around carbon (in the form of CO₂) as a measure and standard of comparison both in terms of price and moral value. The examples of this kind of concern are legion, and voluntary carbon offsets has become an industry in itself.

Several companies offer to arrange voluntary offsets for the energy consumption of private consumers. One such company is Climate Friendly (2013), which trades in carbon credits via their website. Here, you can estimate the emissions of different types of travel or different events (e.g., weddings) and purchase various packages to offset such activities. Alternatively, one can simply buy a specific number of metric tons of carbon credit. Offsets can be given as gifts, too, and naturally there is a link so one can post the purchase on Facebook. By paying with your credit card online, you are assured that you help fund projects such as heat-efficient cooking pots in Africa or windmill constructions in Turkey. The company advertises that it is certified by CDM and the WWF's Gold Standard (see The Gold Standard Foundation 2013).

The Gold Standard is the WWF's attempt to construct certified emission reductions under CDM, which rewards renewable energy or energy conservation projects and not dubious industrial ones such as the above-mentioned destruction of HFC-23 gas. It is thus an example of an actor (the WWF) trying to make things *not* the same and to differentiate real from virtual (MacKenzie 2009: 452). The likeness of the name to the standard, which used to back regular monetary currencies, is probably not a coincidence. The language shrouding carbon transactions is heavily loaded with meaning and symbolism. Voluntary carbon offsets have been likened to the medieval indulgences sold by the Catholic Church (Spash 2010: 188), and they are more likely to target a psychological feel-good factor that a moderately concerned Western consumer can achieve from giving or “doing something” rather than ever actually making a difference (ibid.: 186).⁷ The discourse on carbon in this respect turns on a number of symbols that carry either religious (world savior, indulgence) or economic (gold standard, credit) references both aimed at and associated with the free, rational, Western individual, who can act voluntarily. One could go as far as to argue that because nothing is given in return, many voluntary offsets begin their lives as altruistic gifts donated to the climate and to one's conscience (or as gifts to a friend who is then permitted to continue his or her lifestyle) rather than as payments for one's use. The middlemen and the technologies of accounting and certification then “take the gift out of the offset,” so to speak (cf. Tsing, this issue), and turn it into a commodity detached from personal relationships and clear conscience but commensurate with other carbon-emitting actions. At the other end of the commodity chain, the offset

7. One can also purchase offsets directly via the airline one flies with. SAS, for instance, advertises that it is constantly working on making flights more efficient in terms of emissions, and that paying offsets is *not* indulgence: “The voluntary CO₂ compensation is neither indulgence, bad conscience, or an attempt to divert attention away from the environmental impact of the airplane. It is an entirely genuine way to pay for the reduction of CO₂ emissions via cleaner technology projects” (Scandinavian Airlines 2013, my translation).

payments then become gifts of development to Third World communities construed as needy and paid for doing nothing with their forest carbon stocks. However, where commensuration as a process threatens to erase context and thus differentiation (Espeland and Stevens 1998), there are clear moves to re-imbue the “right” carbon with an aura of quality in the eyes of the consumer. The Gold Standard, for example, claims to trade “premium quality carbon credits” (The Gold Standard Foundation 2013).

The commensuration of spheres

Having presented how the above three schemes for exchange of carbon problematize value, I will discuss how the objectification of carbon can be seen as a problem of commensuration of the different spheres where carbon circulates. My argument is that opponents of carbon trade and offsets see the carbon trading schemes as problematic because the latter conflate different transactional cycles or spheres.

Jonathan Parry and Maurice Bloch (1989) have argued that in numerous (if not all) societies, it is possible to discern two separate *moral* cycles or spheres—one being long-term reproduction of society, the other being short-term gain and individual profit. In the case of carbon, there are several spheres of circulation where differences and thus struggles over value are taking place. Inspired by Parry and Bloch, one could refer to the overarching long-term sphere as that of nature or the environment as a global commons with overriding importance, because it concerns the reproduction of the global social and natural order. A generalized short-term sphere is the market where one can make money on climate change.

Thus contrasting economic welfare and environmental concern, it is apparent how carbon is at the nexus of a number of contradictory practices and phenomena. Labeling carbon offsets as indulgences is one example of how valuations of the economy and the climate are construed as being in opposition to each other. The concern for the climate expressed with indulgence offsets often appears situational and as empty rhetoric—a simulated willingness to act and give up on economic welfare. This situational concern is evident when one day news media will report alarming sea-level rise and complain about greenhouse gas emissions leading to global warming, but the next day lament the economic crisis or the negative growth rates (Blühdorn 2007).

The subordination of the environment to the economy was clear when George W. Bush in 2001 stated in a press release that “for America, complying with those [Kyoto] mandates would have a negative economic impact” (quoted in Hulme 2009: 109). This he would not allow. Even so, the economy is often referred to by carbon trade proponents as the ultimate value. The most well-known example of this is the British *Stern Review* (Stern 2006), which argued that cutting down on emissions today would be cheaper than having to deal with a more costly problem in the future. In other words, saving the environment or ensuring some kind of environmental justice is not a sufficient argument in itself. Ultimately, legislators are more easily convinced of the urgency of acting if told that it will be *financially* cheaper to do so sooner rather than later.

The inclusion of all parts of life into the market sphere has been stressed as one characteristic of the capitalist world system, and the way it is “extended to new domains and then naturalized [is] a defining feature of major historical transitions”

(Edelman and Haugerud 2007: 98). The economy is by some valued over the environment (e.g., Bush on Kyoto), and certification is voiced in economic symbolism (the Gold Standard). Similarly, the individual is symbolically emphasized in terms of voluntary action, which is a positive moral choice (“becoming a world savior”). The disagreement is over how carbon trade can be classified as action. Opponents see it as economic profiteering of the short-term sphere that reproduces and exacerbates social inequalities and worsens climate change, thus destroying the long-term sphere (nature, life) itself. In this vein, opponents have posed arguments that no one should own carbon or profit from it, because it is part of a global commons (see Caney 2010). Neoliberals in particular have it the other way. Either one could argue that they do not differentiate between spheres because capitalism collapses the two orders (Parry and Bloch 1989: 27), or one could argue that carbon trade is exactly a form of action that transforms individual profit from the short-term cycle into moral good as it helps reproduce the social and the natural order. REDD in particular fits into this category, as it can be construed as a double payment to both alleviate carbon emissions and to contribute to development in the Global South.

The question is whether the boundaries between these separate exchange spheres (nature and the economy) are destroyed with the creation of the carbon credit as a form of value or commodity that can transcend them (cf. Bohman 1959). Money as a form of evaluation and scale of comparison has already been used extensively to put a price on nature and natural phenomena (see Espeland and Stevens 1998), but the carbon credit goes one step further in this regard. The carbon credit depends on the climate being implicated in and responding to economic action (Storm 2009), if not outright assuming that the market and the climate react in similar ways when it comes to contingencies, fluctuation, and liquidity (Cooper 2010). Climate change and the uncertainty that it entails is seen as exploitable and imbued with potential profit based on the assumption that the more uncertainty or risk that the climate is worsening, the more profit. Economic growth has traditionally been regarded as based in continuous exploitation of natural resources, but with schemes such as REDD and cap and trade, it is assumed that the climate depends on a zero-sum game of exchanging potentially polluting practices (Lohmann 2010). Carbon trading involves the creation of a sphere of negatives or virtuals, which shadows the world of production, circulation, and consumption (cf. the term “offset”). Carbon (in the guise of CO₂) gains exchange-value by virtue of not being produced, circulated, or consumed, and while one of the ways in which ordinary financial commodities gain value is through the potential of (economic) growth, carbon credits increase in monetary value as the condition of the climate seems to be worsening and caps on emissions will be lowered (i.e., when economic growth threatens to grind to a halt).

The temporalities of carbon as offsets and as currency

The final part of my discussion will outline how exchanges of carbon depend on temporal assumptions of potentiality and durability, which problematize commodification and the construction of commensuration between the different emissions or non-emissions.

The carbon credit seems to make different forms of emissions equal, but it also makes virtual or potential future actions equivalent to real actions, ascribing value

to something that has not happened yet and may never happen. The world of carbon is also temporally seen as a zero-sum game where the balance of accounts on a global scale allows carbon trade to function. Climate scientists argue that it does not matter *where* carbon is emitted in order to affect the climate, and conversely it does not matter either where it is stored or saved. While this claim is based on a number of technical and mathematical operations, these operations rely on several assumptions in order for the commensuration to be applicable. First, the definitions of a baseline or a benchmark for the allocation of carbon permits and emission targets are political choices rather than being based on any ideals of equality, environmental justice, or ethics (Spash 2010: 180). Second, the forms of classification and counting in the move from actual observation to abstract calculation and commensuration decontextualize carbon from the concrete environments where it is stored, circulates, or has an effect. Third, while climate scientists know that carbon must be saved sooner rather than later to avert global warming, the imagined zero-sum game and the construction of equivalents that enable decontextualization still discount the temporality of the social and the natural world in which real-life actions take place. This is the practical question both of *when* emissions and captures of carbon take place and of the *potentiality* that is part and parcel of a temporal perspective. I can offset my holiday trip to Bali for the apparent non-action it is to abstain from clearing an area of forest *disregarding whether that area of forest would have been cleared in the first place*. This is referred to as “additionality” in REDD jargon, and should of course be avoided for the scheme to be effective and morally legitimate. Ideally, adherence to the CDM accounting should ensure that proposed carbon reductions would not have taken place without the project in question, and that carbon is thus truly saved or emissions reduced below an “as if” baseline level, which they would have had in the absence of the project. This involves establishing a credible counterfactual. The WWF’s Gold Standard claims to ensure such integrity in its projects, but there are different forms of accounting depending on the concrete mechanism (MacKenzie 2009: 445), and even the best designed project may fail if the woods planted to store carbon are destroyed in a bush fire (to briefly mention the non-human actors that are not always accounted for in carbon offsetting). In this way, a real consumption of carbon may be offset or exchanged for a virtual and uncertain future planting and growing of a tree with a life cycle beyond that of a carbon credit circulated as a commodity on the market.

In practice, the equivalence between real and virtual or potential action can be impossible to maintain. When is it determined that a project is intended to save or reduce carbon emissions? Can it be applied retroactively? An example is the construction of hydroelectric dams in China that began before the carbon credit came into being, but which still allowed the companies constructing the dams to sell offsets to a German corporation (Lohmann 2009: 1074). In other words, the potential reality of a project coming into being can be easily manipulated, and commensurability is thus made across time as well as space between potentially polluting actions and real polluting actions, with one offsetting the other. The possibility of gaining funding for non-emissions by being awarded carbon permits thus makes it worthwhile to make the threat of emitting. At the same time, though, countries that have done much already to curb deforestation could be rewarded

retroactively. If only real offsets of future non-emissions are considered, then the worst offenders are set to gain the most (*The Economist* 2009).

Finally, one of the challenges often mentioned for REDD is that of ensuring “permanence”—that is, that the carbon resource does not disappear or is not degraded either through man-made or natural actions. REDD relies on this imaginary of potential (non-)action, where forest owners in the Global South will leave their trees alone in return for payments as long as the trees remain standing. REDD is thus a relationship construed as continuous, and the same trees and thus the same carbon will potentially be paid for again and again. For this reason, the ownership of the carbon is in this case termed “stewardship,” and the local forest owners are paid to safeguard the carbon resource, which they no longer have undisputed ownership of. Yet, what is the maintenance of the forest balanced out by? The carbon emitted in the Western world is a done deal once it is out in the atmosphere, but can the equivalent amount of carbon for offsets be entered into the equation more than once? While forests are not static and do absorb carbon (as actors), there are two different calculations involved: first, how much carbon is stored in a specific forest area; and second, how much carbon that forest area is capable of absorbing. The REDD scheme thus at best mixes up the potentiality of action (not emitting that which could have been emitted) with that of (non-human) real action (absorbing carbon over time combined with still not emitting that which is already stored) (*The Economist* 2009). At worst, the REDD scheme entails the controversial and counterintuitive situation where one can purchase the same carbon in perpetuity.

In its physical form as an element, carbon does have permanence, even if the compound forms that are traded do not. With the forms of valuation that are taking place, one could draw an analogy by considering carbon as a new form of virtual or “proxy currency” (Fiske 2009: 280). Notwithstanding the enormously bureaucratic and administrative difficulties it would entail for carbon actually to be a currency, carbon does promise an ultimate liquidity of the economy. If construed carefully (however unlikely that is), the carbon credit can be as good as gold as a standard for money, because potentially there is a physical counter to any carbon credits that appear on paper. Where scholars for ages have debated whether money was to be considered a token or whether money needed certain material qualities in order, for instance, to possess durability (Maurer 2006: 27), carbon in a way promises to bridge this gap. The carbon credit is a piece of paper, but the technology of measuring and accounting for carbon’s physical presence and properties, combined with a substantial legal framework, allows carbon to be transacted without transferring the material itself. Compared to the brands analyzed by Robert Foster in this issue, carbon trade involves at least two forms of “keeping-while-giving” (see Weiner 1992). On the one hand, it is the agency in capturing or storing carbon as a material form that is given by forest owners while forests themselves are kept (but no longer indisputably owned), whereas on the other hand, Western emitters are allowed to maintain (keeping) their patterns of consumption by paying (giving) money for offsets.⁸

8. This point was suggested by one of the anonymous reviewers.

Nonetheless, seeing carbon trade as keeping-while-giving raises the question of whether it would be possible as a consequence of the material/immaterial span of carbon to introduce “the carbon standard” to recreate trust in finance and in the economy following the floating of the US dollar in 1971 and after the 2008 crisis. According to Chris Gregory (1997), the final closing of the gold window by the US government in 1971 signified the decline of the power of the state to regulate the financial markets—a situation that Gregory captures with the term “savage money”; that is, the US dollar became a fiat currency—unfixed and with a flexible exchange rate, it became a commodity unaccountable except to market fluctuations. At the very least, the existence of carbon as a commodity owes itself largely to the agreement between and within states, which means that it has—as regular currencies have—little financial value without action taken by these states. While hardly signaling an end to the power of financial markets, capitalism, and the commodification of an increasing array of spheres of social and biological life, a carbon standard does vaguely promise a return to state-controlled “domesticated” money if those same states really wanted to gain control of the markets.

Conclusion

Carbon plays a crucial role in our contemporary world. Because the term can refer to several different entities from the scientific (CO₂ equivalents) through the financial (credits or permits) to the everyday (offsets and footprints), and is embedded in complex systems and processes of valuation, it can be difficult to get one’s head around it. Carbon is embedded in various forms and compounds, and both natural and socioeconomic orders depend on its circulation. The objectification of carbon that has resulted from responses to global warming nevertheless commensurates otherwise separate moral spheres. It can do this because as a standard, carbon can successfully measure and thus compare all carbon-emitting actions. As such, carbon is implicated in struggles over value in several ways: To begin with, it forces one to think about what is considered fair about the global economic system, and the institutional arrangements through which the relationship between industrialized and developing countries is negotiated (e.g., McMichael 2009b). It also relates to moral understandings and thus to basic values underpinning cosmological ideals involving humankind’s place in relation to nature, and consequently to such different concerns as environmental justice, human rights, ownership of the commons, and the like (e.g., Fiske 2009; Caney 2010). At the same time, carbon as a sociological phenomenon entails an objectification in terms of economic value, which must be comparable, measurable, and commensurable across a wide range of human practices and products across space as well as time and abstracted from context and history (Lohmann 2009: 1073). Yet, because of the multitude of concerns involved in valuations of carbon, it is highly unlikely that any agreement will be reached regarding what kinds of problems carbon emissions pose, and how they should be prioritized (e.g., Fiske 2009: 280).

Carbon permits and offsets in many cases depend on the identification of an appropriate and matching action to negate one’s pollution. It is based on the assumption that someone not only could but also *would* have acted otherwise. It is, in other words, the comparison of actual actions with potential actions (that never happened, but could have happened). It is making actions valuable by reference to

non-existing action. This is not unusual in the contemporary capitalist economy in particular with regards to the commodification of risk. Related to what economists refer to as opportunity costs is how actions gain value by being compared to non-actions of various kinds—that is, with reference to the counterfactual. What is interesting is whether those actions really are potential actions, and how they become construed as such; that is, what is the balance between the possibilities of their reality and virtuality?

At the same time, some regard the commodification of carbon as the result of capitalism as usual, with its dependence on crises or risk in order to make profit. Carbon seems to be an agent in this by creating commensurability between diverse practices (and non-practices), which all can be measured and compared in terms of carbon emissions. Carbon displays the potential as a standard of value to transform diverse moral spheres, and in this way carbon may itself take on the qualities of a (virtual) general-purpose currency. Carbon can in that way be a heuristic in understanding the commodity chains of the present (as opposed to the converse use of concepts from financial markets, such as derivatives and risk, to understand carbon trade—e.g., Lohmann 2010), and it may help us understand in what future direction transactions and formations of value pertaining to larger social orders are heading.

To be sure, carbon has the potential to become a key empirical term in discussions of value. It connects very different moral spheres of value, but it also disconnects societies and groups through the (re-)production of social inequalities. Carbon as an object and potentially as a currency makes all actions comparable and even commensurable, but there is great resistance to this dissolution of differentiations. While general-purpose money historically enabled new forms of exchange, it did not mean the dissolution of all moral spheres (Parry and Bloch 1989), and carbon as a standard or as a currency would perhaps also depend on several forms of distinction. There are different forms of certification, and there are differences between compliance and voluntary actions and between projects and markets, as stipulated in the Kyoto Protocol. So, all values are not equal, even though carbon as a standard of comparison and measurement does align a multitude of different human and non-human practices.

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References

- Blok, Anders. 2010. "CO2-markeder—en ny form for kulstof-kolonialisme?" *Global Økologi* 17 (4): 18–20.
- . 2011. "Clash of the eco-sciences: Carbon marketization, environmental NGOs and performativity as politics." *Economy and Society* 40 (3): 451–76.
- Blühdorn, Ingolfur. 2007. "Sustaining the unsustainable: Symbolic politics and the politics of simulation." *Environmental Politics* 16 (2): 251–75.
- Bohannon, Paul. 1959. "The impact of money on an African subsistence economy." *The Journal of Economic History* 19 (4): 491–503.
- Braun, Marcel. 2009. "Evolution of emissions trading in the European Union—The role of policy networks, knowledge and policy entrepreneurs." *Accounting, Organizations and Society* 34 (3–4): 469–87.
- Bridge, Gavin. 2010. "Resource geographies 1: Making carbon economies, old and new." *Progress in Human Geography* 35 (6): 820–34.
- Callon, Michel. 2009. "Civilizing markets: Carbon trading between *in vitro* and *in vivo* experiments." *Accounting, Organizations and Society* 34 (3–4): 535–48.
- Caney, Simon. 2010. "Markets, morality and climate change: What, if anything, is wrong with emissions trading?" *New Political Economy* 15 (2): 197–224.
- Climate Friendly. 2013. Climate Friendly. <http://www.climatefriendly.com>.
- Cooper, Melinda. 2010. "Turbulent worlds: Financial markets and environmental crisis." *Theory, Culture & Society* 27 (2–3): 167–90.
- The Economist*. 2009. "Last gasp for the forest: Paying to save trees." September 24, 93.
- Edelman, Marc, and Angelique Haugerud. 2007. "Development." In *A companion to the anthropology of politics*, edited by David Nugent and Joan Vincent, 86–106. Oxford: Blackwell.
- Espeland, Wendy, and Mitchell Stevens. 1998. "Commensuration as a social process." *Annual Review of Sociology* 24: 313–43.
- Filer, Colin. 2012. "Why green grabs don't work in Papua New Guinea." *Journal of Peasant Studies* 39 (2): 599–617.
- Fiske, Shirley. 2009. "Global change policymaking from inside the Beltway: Engaging anthropology." In *Anthropology and climate change*, edited by Susan A. Crate and Mark Nuttall, 277–91. Walnut Creek, CA: Left Coast Press.
- Gad, Christopher, and Casper Bruun Jensen. 2010. "On the consequences of post-ANT." *Science, Technology, & Human Values* 35 (1): 55–80.
- The Gold Standard Foundation. 2013. The Gold Standard: Premium quality carbon credits. <http://www.cdmgoldstandard.org>.
- Gregory, Chris. 1997. *Savage money*. Amsterdam: Harwood Academic Publishers.

- Hulme, Mike. 2009. *Why we disagree about climate change*. Cambridge: Cambridge University Press.
- Kanter, James. 2007. "Carbon trading: Where greed is green." *New York Times*, June 20. <http://www.nytimes.com/2007/06/20/business/worldbusiness/20iht-money.4.6234700.html>.
- Latour, Bruno. 2004. *Politics of nature*. Cambridge, MA: Harvard University Press.
- . 2005. *Reassembling the social: An introduction to Actor-Network-Theory*. Oxford: Oxford University Press.
- Lohmann, Larry. 2008. Carbon trading, climate justice and the production of ignorance: Ten examples. *Development* 51 (3): 359–65.
- . 2009. "Climate as investment." *Development and Change* 40 (6): 1063–83.
- . 2010. "Uncertainty markets and carbon markets: Variations on Polanyian themes." *New Political Economy* 15 (2): 225–54.
- Lovell, Heather, and Diana Liverman. 2010. "Understanding carbon offset technologies." *New Political Economy* 15 (2): 255–73.
- MacKenzie, Donald. 2009. "Making things the same: Gases, emission rights and the politics of carbon markets." *Accounting, Organizations and Society* 34 (3–4): 440–55.
- Maurer, Bill. 2006. "The anthropology of money." *Annual Review of Anthropology* 35: 15–36.
- McMichael, Philip. 2009a. "The agrofuels project at large." *Critical Sociology* 35 (6): 825–39.
- . 2009b. "Contemporary contradictions of the global development project." *Third World Quarterly* 30 (1): 247–62.
- Midtrafik. 2010a. *Bliv verdensredder*. Høbjerg, Denmark: Midtrafik.
- Midtrafik. 2010b. "Klimafakta." Verdensredder in action. <http://www.verdensredder.nu/klimafakta/>.
- Mitchell, Timothy. 2009. "Carbon democracy." *Economy and Society* 38 (3): 399–432.
- Parry, Jonathan, and Maurice Bloch, eds. 1989. *Money and the morality of exchange*. Cambridge: Cambridge University Press.
- Scandinavian Airlines. 2013. "Det kan du gøre." Om SAS—miljø. <http://www.sas.dk/Om-SAS-Danmark2/Miljo/Det-kan-du-gore/>.
- Spash, Clive. 2010. "The brave new world of carbon trading." *New Political Economy* 15 (2): 169–95.
- Stern, Nicholas. 2006. *The economics of climate change: The Stern review*. Cambridge: Cambridge University Press.

- Stonington, Joel. 2013. "Wake-up call: A disastrous week for carbon trading." *Spiegel Online*, January 25. <http://www.spiegel.de/international/europe/drop-in-carbon-price-underscores-disastrous-week-for-carbon-trading-a-879769.html>.
- Storm, Servais. 2009. "Capitalism and climate change: Can the invisible hand adjust the natural thermostat?" *Development and Change* 40 (6): 1011–38.
- United Nations Framework Convention on Climate Change (UNFCCC). 1998. *Kyoto Protocol to the United Nations Framework Convention on Climate Change*. Geneva: United Nations. http://unfccc.int/kyoto_protocol/items/2830.php.
- Weiner, Annette. 1992. *Inalienable possessions*. Berkeley: University of California Press.

La commensurabilité du carbone : faire de l'argent et de la valeur avec le changement climatique

Résumé : La mise en place du Protocole de Kyoto est une tentative pour sauver le climat à travers un certain nombre de systèmes, ou mécanismes, qui commodifient le carbone. Ces systèmes créent, entre autres choses, des incitations financières pour réduire les émissions de carbone à travers le commerce des permis et des crédits, et ils font du carbone un objet de spéculation financière. Le plus controversé serait le potentiel du carbone à servir ainsi de critère universel de valeur par la mise en équivalence de sphères morales de l'action humaine (l'environnement, l'économie, le développement, etc.) que certaines personnes considèrent comme distinctes. Cet article explore les conséquences des aspects spéculatifs du carbone comme étalon de valeur et comme monnaie potentielle.

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