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The miner and the activist: an Australian parable for our carbon constrained world

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1. Introduction

One of the most heated debates at both a national and international level currently revolves around the issue of 'carbon'. We see discussions on carbon emissions, carbon trading, carbon tax, carbon offsets, carbon sinks and carbon-free economies just to point out a few. The lexicon of climate change discussions has shaped the way we think of our life style (such as our 'carbon-diet') to moral debates (around our 'carbon-guilt') (Koteyko et al. 2010). The topic of carbon is inextricably linked with greenhouse gasses and, consequently, global warming. Debates here are inevitably complex, involving many stakeholders, and revolve around various issues such as the valuing of carbon, parts per million of carbon, the economic impacts of reducing carbon emissions as well as the environmental consequences of 'doing nothing'.

Carbon, then, is a hot topic. Despite this, most of us have no idea what exactly it is. Yes, it results from high polluting industries and the burning of fossil fuels, but it also occurs naturally from animals and the soils. Even so, we do not really see it or touch it, and when traded, someone does not deposit it into an account or carry it in their pocket.

The many complex debates that we mention above also highlight that carbon can mean different things to different people. Alternatively, more accurately, it can mean many things to each one of us. Carbon, for example, is the economic lifeblood of the miner - though it can also be her death sentence if over exposed. For this same miner, carbon can be part of an industry that pollutes the neighbourhood in which her children may play in, or threaten future generations. Carbon sustains the community, however, and while we may chant "no jobs on a dead planet", these threats are somewhere into the future while the next mortgage direct debit is a few days away. The area is going well because China loves our coal, but the rumours are that falling prices may cause this mine to close even though the local Member of Parliament assures the unions that they will do everything that they can to ensure this does not happen. Here carbon threatens, exploits, supports and gives opportunities.

Carbon is also something that the environmental activist confronts while blockading a coalmine. The activist drove there in her beloved '78 Falcon² and plans to fly to the Torres Strait Islands to work with some of the communities already being affected by global warming - the potential refugees of the 21st century. She does not eat meat because livestock is more carbon emitting than a vegetarian diet: though the food miles of the asparagus grown in Turkey concerns her. This mine supplies dirty brown coal, and rumours are that it may close as China looks for a cleaner alternative - something that the protester cynically accepts as a good thing. The Australian Green Party are here in support of the blockade - speaking at the protest and telling the crowd that alternatives are possible and we should remember that the federal government is continuing to subsidise the coal industry. Carbon here is horrible, threatening but a necessity of life that must be reduced as quickly as possible.

Discussions around carbon, then, need to acknowledge that carbon is a complex and fuzzy topic that has sociological, cultural, political, economic and environmental meanings and implications. Most debates and discussions around the issue, however, tend to prioritise one of these perspectives. As such, depending on where you stand, the metaphors and language used to discuss carbon varies significantly - from 'carbon-delusion' to 'carbon-addiction' - making communication seemingly impossible (Koteyko et al. 2010, 33). This is something that is neither surprising nor unexpected, but does result in discussions that work at

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cross-purposes. This is further complicated by the fact that carbon, like other types of 'property', is subject to changing and often competing demands (Quinn et al. 2010).

This paper aims to review the meaning of carbon by applying five broad questions to this controversial substance: what is land; what is property; what is ownership; what is value; and what are property rights? By exploring each of these questions, we aim to show that a multidimensional and complex understanding is required for effective policy discussions to confront the challenge of global warming. In many ways then, this paper presents a challenge to Maine's (1861) 'bundle of rights' approach that was perpetuated by Quinn et al. (2010). In so doing, we aim to expand discussions regarding the political economy and ecology of property rights that a number of authors have raised in this journal (Bauer 2006; Pattberg 2007) as well as the broader property rights literature associated with natural resource governance (Grafton 2000; Ostrom 1990). We conclude by considering the implications of property rights for carbon for polluters, governments, us as individuals with a right to breathe clean air, as well as the global commons and other species.

2. What is land?

As we stand on a beach and our toes touch the sand, such a question seems absurd. We can answer this questions simply by saying it is the earth we are standing on. Even if we have a desire for simplicity, however, this fails to consider what lies beneath the soil we are standing on, or exactly where land stops: if our feet are covered by water, is this still land? Does land include the air above?

If we accept the need for a more complex understanding, then we need to see the very concept of land as at least partially social constructed: that is, much of its meaning results because we as humans assign it meaning. In this way, land can be thought of as having economic value. It has made many people very rich, while losing land has devastated others. Some see land as a mere commodity to be traded, while others find economic security in owning a piece of land that guarantees them a haven in hard times or old age.

This devastation is not simply because of the economic value, but the meaning and identity we link to land. Land is part of who we are: it reminds us of where we grew up; our family and friends; it is part of our country. Lost or gained land also influences how we feel about our heritage and ourselves. Land ownership, or lack thereof can be a catalyst for political instability or the source of great personal fortune.

Importantly, our relationship to land varies across cultures in what has been described as 'high and low context' societies (Burgess and Burgess 1997). Low-context refers to the straightforward management-style approaches that dominate in the west, while high-context is linked to more culturally sensitive societies (including indigenous and traditional cultures). There is no single context for any society, as each one has some combination of both.

What does this have to do with carbon? Our view of 'land' is often a guide to how we see the world and, therefore, will influence the way we view carbon. For example, if we have a libertarian view of land, then carbon is something that every one of us can actually own. From this perspective, each individual can even be assigned 'carbon rights' or a 'carbon quota' and have the right to use these rights or quotas as they see fit. If an individual wants more, then they may be able to buy more if someone else has part of their quota available to sell. If you need less, then you have the right to sell your excess quota. Fundamental to this approach is the idea that we see certain rights attached to carbon.

In contrast, if you took an environmental justice perspective, you could argue that the ownership of land is something that needs to be reviewed based on history and appropriation. The use of carbon also would need to be reviewed in this way. The argument follows that industrialisation has benefited the wealthy few while the majority of the world have been exploited. In this way, the wealthy few 'owe' a carbon debt to the majority of the world's population.

For Indigenous populations, or deep ecologists that support the concept of custodianship of land, then carbon discussions cannot be separated from how we treat the earth more generally. Any carbon rights must be matched with responsibilities to the broader community as well as non-human species and the planet.

We draw these examples almost as caricatures to highlight the difficulties that exist in understanding intercultural as well as cross-cultural debates about climate change. Some significant complexities need to be reconciled (somehow). How do we respect the rights of future generations, ensure the health of the planet as well as continue to strive for some sort of material form of 'development'? How do we match the rights demanded by libertarians with responsibilities across time and space? How do we confront entrenched power relations that mean we have unfair distribution of land as well as carbon, which sees few living well while most live precariously? Further, what is the most sustainable long-term model we can apply?

3. What is property?

The second question that we need to raise is what is property? Property refers to the ownership of something: this is my property! We can be talking about a pair of mighty fine red shoes, a hat, or land.

Having already problematised the concept of land, it becomes evident that a more complex understanding of property also needs to gain acceptance. We can begin by thinking of property along a spectrum with the extremes being a 'property absolutist' or 'property relativist' (Gray and Gray 2005). That is, is the ownership of land something that is unqualified and sacrosanct or is ownership something that is redefined by social context and broader obligations to your community, however defined, and the earth? Likewise, we see access to carbon production as simply the use of a kind of property that some of us can own and consume unproblematically. Here, no one has the right to interfere with this right. This returns us to the libertarian view.

However, we can also ask if this unproblematic right existed in the past long before the effects of human activity and carbon production were well established? On the other hand, is this position masking power relations that always existed? If you believe this is the case, then claiming ownership of land and carbon at the expense of others is something that can only be achieved by exclusion and power (both overt and covert). Here libertarian claims merely exist to enforce the status quo and must be challenged.

The second point in discussing the issue of property - and that relates directly to carbon - is to determine the principle objective of property law. Does property law exist to ensure certainty for those who own property (or wish to acquire it) or is it there to ensure a fair and just outcome? That is, according to Gray and Gray (2005), does property exist to ensure a just outcome or merely an economically efficient outcome.

We again can refer this concept to carbon. Does the designation of property rights exist to ensure certainty to those polluting and producing heavy carbon outputs, or is it being designed to reduce carbon emissions with Torres Straight and Pacific Islanders in mind. Is it possible to achieve both? How do we design a system of property and ownership that can find a balance between these two extremes?

The property associated with carbon is, therefore, also complex. It is not just the carbon itself that we must consider when reflecting on property, but the many things around it. This is because the carbon of the activist and that of miner occupy the same space, as it can never be clearly delineated.

In an attempt to understand this complex relationship, we can draw on Waldron (1988) who considers the relationship between an individual and property. Waldron argues that a relationship between a person and the property they own is complex. If we take the example of the '78 Falcon 'belonging' to the activist, it is her property (right), but she must keep it road worthy ensuring her brakes (as well as brake lights) work (obligation). Her property is also responsible for polluting the environment in which the children of the miner play in. Consequently, her property is a direct producer of carbon that she is directly responsible for (and as such, she subject to any related restrictions). Is this responsibility to the property different to the responsibility that of the carbon that industries claim as their own to produce or have the right to sell?

Returning to the absolutist/relativist continuum discussed above, we can see that no matter where you stand there is a need to recognise that the relationship between the activist and her property is not simple. As soon as the activist starts her car, there are a bundle of responsibilities and rights that follow, which links her with all of us - from the miner to those negotiating a global environmental regime in Copenhagen in 2009.

However, if you own a 'piece' of carbon, how does that compare to owning a car? With a car, you can sit in it and listen to music. But what do you do with carbon? With a car, you can sell it or lend it - altering the relationship that you have with this property asset? Can you do this with carbon?

Property is merely a social construction designed as a legal entity for governing our relationships between, for example, you and things, you and the authors, as well as things and you. It can be altered, adapted and made into something different. The question then, is whether it even makes sense to talk about carbon in terms of property. However, we have to if it is to be commoditised for transfer, or to underpin an emissions trading scheme. For centuries, there has been no notion of property rights over carbon. So, in establishing such a concept or the 'idea' of property in carbon, there is a need to reflect on the broader context in which such laws are being designed and understand exactly what they are meant to achieve?

It is important, however, to acknowledge the limitations of the law and what could be construed as a limiting over-reliance on precedent when confronted with emerging forms of property (for example water, carbon or biota). The "abstraction of property as a bundle of various rights, such as use, alienation, exclusion and possession is inconsistent with the fundamental tenets of an environmental ethic, which emphasize both context-specific interconnectedness and the value of the object itself" (Arnold 2002, 283). Arnold stresses the importance of the object of the property interests, whether tangible or intangible. Prior scholarship into property rights and ecological issues has not stepped "out of the box" to formulate a "broad-based metaphor of property based on the interconnection, *thingness* (object-regard), and the uniqueness of the objects of property" (283). He argues that the time has come for property theorists to 'reconstitute property' to engage with the sociological and ecological. Drawing on three strands of current

legal thought - environmental, personhood, and expectations theory of property - Arnold proposes the replacement of the "metaphor of property as a bundle of rights with a metaphor of property as a web of interests" (284). Importantly, Arnold's web metaphor focuses researcher attention on particular properties of property, such as "the ecological characteristics of land and other natural resources as inherent limits to their use, or a holistic understanding of the interests people share in resources" (344-345).

However, we are not convinced that Arnold's web of interests goes far enough in pushing the boundaries of legal understanding in the context of ecology when it comes to the importance of emergence of carbon as real property. In our other discussions on carbon property rights (Boydell et al. 2009a; Boydell et al. 2009b) we have drawn guidance from the work of von Benda-Beckmann et al. (2006) in finding a way of understanding a 'constellation' of property rights. This approach has allowed us to analyse how the influence of the activist, which resulted in the ideological Kyoto agreement, has travelled through the economic, sociological, environmental and legal layers of society to ultimately be concretised in legislation at the level of local councils and jurisdictions around the world (Boydell et al. 2009b).

4. What is ownership?

The previous section showed the complexity of property and by extension, the different rights and responsibilities associated with owning property. In this section, we will attempt to further our interrogation of this idea of ownership.

There is really no concept of property or ownership in nature - this too is a human construct (Demsetz 1967). Further, claims of ownership only exist in relative rather than absolute terms. For example, if you lived all alone as a contemporary Robinson Crusoe, for example in central Australia and without contact with other people, you would be ignorant about the concept of ownership. As soon as others arrive and start claiming that this corner is 'theirs', then you will probably start claiming that this section is 'yours'. Through the notion of self and other, ownership is intertwined with ideas of territoriality and proximity.

From this point, we take a twin view of ownership: defining it both by what is 'mine' as well as what is 'not mine'. Ownership and property exist in a relationship between people. Once that line is drawn between what is mine and what is not mine, at the naïve level as a bundle of rights and also as a constellation of rights, there are related expectations, responsibilities, negotiation, obligations and protective (territorial) instincts emerge. We can see here how the fallacy of the 'rational economic man (or woman)' falls down: the relationship we have with ownership and those around us will be dependent on a complex set of interactions, both rational and otherwise, with the human and non-human world around us.

In terms of carbon then, what exactly is it that you/we own? How can the Government assert ownership over a property that is a bi-product of our contemporary industrialised lifestyle? You never get to walk around with the carbon or enjoy it as a consumerist or material item – rather the carbon footprint is often because of the products we purchase. Carbon is simply something that hitherto existed without the idea of ownership - like land in certain cultures. Now we have too much carbon and we want to reduce it: by giving us own little piece of carbon, how does this alter the relationship that we have with those around us?

In a globalised and interactive world with 8 billion people, proximity also plays a role. Your ownership of carbon, or your ownership in property rights that give you scope for carbon sequestration, is not a simple concretised manifestation of your Government's overarching policy that resulted from the ideology of Kyoto. Rather, our complex and interconnected world is also reliant on what is happening in India, China, Bangladesh, and the Solomon Islands and so on. Ownership of property, land or carbon, is not as simple as asserting 'this is mine': rather, it is something that must be understood in a broader context of what others are doing.

Ownership then is not only a result of proximity, but significantly affected by scarcity and the influence of supply/demand. Claims of ownership only emerge when we start thinking that there is not enough to go around and, as a result, we better claim our share – and claim it early. This is the precise policy conundrum (which never manifested as ideology) that our leaders were trying to negotiate at the 2009 Intergovernmental Panel on Climate Change in Copenhagen: how much scarcity is associated with pollution of carbon? How much of this bi-product, which exists in abundance, are we allowed to produce? How do we make it scarce while enjoying all the benefits associated with a world that made it abundant?

Further, who has the right to claim more of it? What does 'more' of it mean anyway? Does more mean more per person or more per state? Like the visitors who invaded the space of Robinson Crusoe, the emergence of India and China as major economies make such negotiations all the more urgent.

5. What is value?

The issue of value is also a complex one. When it comes to what is valued, we need to weigh up our wants and needs. We can ask people what they value and how they might price this, but the answer will always fail to capture what is really going on and is a static perception.

To begin with, the issue of food is valued today differently to what was considered valuable only a generation ago. Food scarcity is no longer an issue in Australia and it is likely that 'food' would not be the first thing that springs to mind if we ask the miner what she values. The answer could be family, health, or peace of mind. For the environmental activist the response could be very different or similar: would she mention these three things or place a clean environment first? Is there any reason to suspect that the miner would also fail to consider the environment as something to be valued?

We can see how the priorities are also a function of time, place and experience: the top 10 priorities in Australia would be very different to what is prioritised in say Zimbabwe. Likewise, our parents would have had a different list when they were living in Greece or England.

The most prevalent way of assessing what is valuable (and hence what we value) is through the market mechanism. We rely on the laws of supply and demand to direct us towards the right market prices.

There are two problems that we must consider when applying the issue of value to carbon. The first is that the market mechanism is compromised, for the laws of supply and demand do not exist outside of political and social decisions. Our Australian government has subsidised the coal industry for most of its existence, a benefit/subsidy that has not been similarly extended to the renewable energy industry. The market mechanism does not set the price here: the market mechanism is a function of political decision-making.

The second problem is that the market mechanism cannot deal with the issue of the 'priceless'. What then is the value of a clean environment? What is the value of an environment that is pleasant to look at? What is the value of knowing your children are likely to grow up without diseases brought on by carbon-intensive industries? We can see that such questions are ludicrous and whilst economists may ponder them, they really are impossible to adjudicate. Despite this, some economists persist in presenting us with a model of 'willingness to pay' (see, for example, Amigues et al. 2002; Kronenberg and Winkler 2009; Longo et al. 2008; Pate and Loomis 1997; Solomon and Johnson 2009; Verbic and Slabe-Erker 2009): that is, asking people what they would be willing to pay to enjoy a pollution-free beach (Baumgärtner et al. 2009; Winkler 2006a, 2006b). While a discussion here is beyond the scope of this paper, there are some obvious limitations to this approach. The first is that it cannot deal with the issue of the 'priceless': who can put a price on having a healthy child? The second is the class distinction that such a theory ignores: what is considered a reasonable amount to pay by someone who is wealthy is not the same for someone who is struggling financially: it does not mean that someone loves their children more or less.

When it comes to carbon trading, we also need to reflect on what we value, how this varies and how it is imbued with power relationships. What price do we put on industrialisation? What price do we put on the dignity of employment? What value do we put on the homes and ancestral lands of those living in Tuvalu (Oceania) or the Torres Strait (northern Queensland)? The coal lobby in Australia is much better at discussing the value of the coal (and hence carbon) than the Torres Strait Islanders may be in articulating carbon and the potential loss to their heritage that global warming or sea level rise may manifest.

This takes us to the value of carbon: how do we price it? What are the mechanisms we employ? How do we deal with power relations? Who has the right to set the price initially? Do those who are most likely to suffer the consequences have the right set the price? On the other hand, what about those who use and produce carbon the most?

Such questions are obviously loaded with moral, ethical questions and power relations - and there is no simple answer. Rather, once value is acknowledged, a more in-depth understanding of the issues can be articulated and found. Likewise, such acknowledgement will mean that different intellectual frameworks are understood and improved communication is possible - something Koteyko et al. (2010, 49) emphasise in their analysis of climate change discourses.

Now that we have strung together issues of land, property, ownership and value, we can combine these to investigate the nature of property rights.

6. What are property rights?

We begin this section by acknowledging one of the few things that we can be certain about: private property rights are the cornerstone of the global capitalist economic system. Since Adam Smith (1776, 1976 reprint) and John Locke (1690, 1924 reprint) perpetuated the philosophical foundations of modern capitalism, private property rights have been an unchallenged tenet in Western mainstream socio-political policy making.

Private property rights are also the foundation of raising capital (when used as security) and drive economic growth. This is another foundation of the modern economic paradigm: economic growth and ever-increasing gross domestic profit is seen as essential for raising living standards, material wealth and, ultimately, happiness by many in the contemporary world.

Despite this dominant paradigm being the economic cornerstone of every major political party, it is a

perspective that has been challenged. From ecological economics to Schumacher's (1973) 'small is beautiful', we have seen an increasing concern about the nature of sustainability and the impacts of an unending economic growth model. The estimation that it would take the equivalent resources of six Earths to allow each and everyone to live like a USA citizen is a clear sign that such growth paradigms need to be rethought.

To add confusion to the mix, there is a lack of clear economic definition on what property rights are, and any definition must be flexible enough to acknowledge the changing nature of the phenomenon.³ When John Locke was writing, property rights could be thought of as all the assets bound by the fence around your house including the land itself. Despite the fact that most forms of property, as we have noted, have mixed management regimes, Quinn et al. (2010) note that the perception that ownership rights remain exclusive. As economies developed and changed, so did the need for a more inclusive and comprehensive definition. Furthermore, patents, the human genome project, the internet and now carbon (to name a few) all add exponential levels of confusion to this once simple definition. As we highlighted above, we have gone beyond the 'bundle of rights' (first articulated by Maine 1861) through Arnold's (2002) 'web of interests' and engaged in the notion of a 'constellation' of real property rights (Boydell et al. 2009b; von Benda-Beckmann et al. 2006).

The legal definitions offered are much more comprehensive, and for anyone but property lawyers no less confusing. Such definitions, however, have important bearings on the socio-political climate we live in. The fact that few music fans consider the burning a CD version of the latest Pearl Jam album a real crime equivalent to shoplifting an equally-valued T-shirt, shows that the application of laws have an important bearing on how we see the world. The link between different forms of legal regulation and diverse human actions has long been established (Bollier 2002).

Property rights also influence the type of social interactions we can have. For example, what are the different relationships that emerge when a property owner is forced to allow access to her land for bush walkers/hikers? This creates a social interaction that no doubt influences the attitudes of both the property owner and the walkers.

Property rights also have important environmental effects. At the time of writing, a farmer, Peter Spencer, had just come down from sitting on top of a pole on a hunger strike that he began because the New South Wales state government of Australia has laws that forbid him from clearing native vegetation on his farm. This has effectively reduced the acreage available for farming and rangelands, as forests regrow and spread. The laws were linked to an earlier effort by the Australian Government to sequester carbon by locking it up in native forests (ABC Rural 2010). What one has the right to do, or not do, in the privacy of one's property has serious consequences on both the local and global environments. And, global concerns over carbon management influence local landscapes.

Despite the fact that property rights are the cornerstone of our economic system, we also see a long history of concern about claims to private property. From Jean-Jacques Rousseau (1762, 1973 reprint), through to Proudhon (1840, 1969 reprint) and Macpherson (1978), claims to property are seen as creating friction and conflict, with the latter seeing property claims essentially as theft. Some scientists have long echoed some of these concerns, while many others have embraced the economic potential of placing strict and inalienable property rights on their research developments.

No doubt, there is a spectrum here, with some claims of property more dubious than others are, and some quite clear cut. Either way, however, how relevant are all these debates without an appropriate definition? Or are we best off accepting Macpherson's (1978) statement that "the meaning of property is not constant"? According to Macpherson, meaning changes across time and space, and is reflective of power relations in our society. Such a position should not come as a surprise if we have followed the logic of the first four questions asked in this paper, as each one has confirmed the fact that these are just as much social questions as they are economic, political and legal.

We can also see this uncertainty play out in the way that property is seen as a security blanket: security from government and social interference (for example, 'what I do in my own home is my business'), to economic security ('something for my retirement'). This makes any discussion about property rights encased in even more emotive and complex arguments about privacy, governance, liberty, freedom, sustainability and so on. All these issues take us into a complex arena as we see property rights negotiated across a constellation of rights and obligations.

This returns us to the fact that rights cannot be seen in isolation, and that there are hierarchies of rights. That is, how do we reconcile a right to clear fell the trees on your land in order to sustain a farm, with the rights of future generations for a safe environment? If someone's rights are given priority and they intrude on yours, how is the threat to your perpetual interest matched with the need for broader compensation resulting from your actions?

³ See the work of the Asia-Pacific Centre for Complex Real Property Rights, University of Technology, Sydney. www.dab.uts.edu.au/research/centres/apccrpr/

7. Property rights and carbon: a conclusion of sorts

Let us return to the issue of carbon and property rights. To begin with, we must leave any wonder behind regarding the clash of both rights and obligations, as we all occupy different positions across this constellation. This also means that we all use a different lexicon to conceive of carbon. Like other diverse and complex environments, carbon also requires "more diverse and complex management regimes to deal with multiple users" (Quinn et al. 2010, 1).

Another set of issues to consider before reflecting on carbon and property rights, are the sociological barriers we face. As property rights are such a basic tenet of western civilisation, we often cannot imagine how the world would look without them and they have become an integral part of our relationship with nature (Pattberg 2007). We do need to remember, however, that their complexity means they can best be analysed with a transdisciplinary perspective (see, for example, Max-Neef 2005; Nicolescu 2006), looking at a 'spectrum' or 'constellation' approach. Sometimes exclusivity of rights is the answer, while at other times, we need to be able to embrace common property: a form of property that has worked for much longer than private property has existed.

So, to the big question: when the miner and the activist eye off each other about carbon extraction and emissions, how do we understand what is going on in terms of property rights? Does *one* simply want to keep the (carbon in the) coal in the ground, tucked away like a buried treasure never to see the atmosphere, while the *other* wants to release it for both her economic benefit as well as the economic well-being of her community? Furthermore, whose property is this commodity anyway? We are not talking about the coal that is being mined, but the carbon that is being emitted through its subsequent processing and use.

The first thing we need to accept is that carbon property rights are different to other rights (Hepburn 2009). We are not talking of something that you hold, but rather something that is an unfortunate bi-product of other activities. As such, we can use carbon as the opportunity to trigger a review of our understandings of property rights, with the acceptance that we need a constellation of rights rather than a single group of rights that cross all types of property. Likewise, the carbon property rights associated with coal and aluminium mines need to be different to the ones attached to farmers and hospitals. Mining corporations have been allowed to pollute without punishment or control for a long time, so is it now time to compensate the community, which ultimately 'owns' Australia's natural resources? We are not talking about a new tax on coal that disappears into the ether, but one that flows directly into creating alternative energy sources. Such a policy decision would act as an incentive to establish a vibrant renewable energy industry: subsidised as the coal industry has been for decades.

Families and individuals also have the right to emit carbon, but for us too, the free ride is coming to an end. It is time that we paid a tax for pollution caused by cars and planes that flows directly into alternative energy sources; if you can access a train/public transport but choose to drive, then you should pay a tax for the privilege. If public transport options are not available, then you can claim a tax concession. This can act as an incentive to build alternative infrastructure and to support liveable cities.

These rights should be thought of not as private property, but as public trust rights over the commons (Bollier 2002). We are paying compensation to everyone else in the trust - both current and future generations - to use this trust. The money can be used to ensure that the trust has capital to maintain and repair itself. For those who can add to the trust, then let them make money. This will allow the correct combination of the free market and the concept of common stewardship that will allow the trust to benefit.

This takes us to the second issue of carbon property rights: we need a clearer political and legal definition of property rights for carbon. Such clearly defined rights are essential for the management of all types of property - from commons to private ownership (Bauer 2006). This should be combined together with a register of these interests, so everyone is clear on who can use what and how much it will cost. This is not a tax, but an incentive to make the system more efficient.

Thirdly, we need to see carbon emissions for what they are: a filthy pollutant of the commons. How many of us would rather live next to an open cut mine or a coal fired power plant, compared to a national park? And yet, most of us in the western world enjoy the benefits of coal as a prime energy source. A decrease in carbon use can have other health benefits, for community and for wellbeing, but we cannot yet quantify these within our axiology or value systems.

This returns us to the miner and the activist. When the activist is about to attend the protest, she parks her Falcon down a side street and sees a woman sitting there crying. She shows compassion and the attributes of good neighbourliness for the woman, and discovers she is upset because she has just lost her job as a mineworker. It was not due to coal exports being cut, but rather because new technologies have been employed that are more efficient and require fewer workers. She has no idea what to do next. As the activist listens to this, she feels no satisfaction as she realises that this woman, like the other miners, are not her enemies. Rather, a shared humanity needs to be identified to get us out of the mess that is not neatly defined by the binary categories, 'activist' vs. 'miner'. By understanding where this overlap occurs, we can

find the balance between economic growth and environmental and community protection, consumerism and tradition, freedom and obligation, as well as economic imperatives and environmental responsibility, not only for us, but also for all species and future generations.

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Abstract

This paper reviews the meaning of carbon by applying five broad questions to this controversial substance: what is land; what is property; what is ownership; what is value; and what are property rights? By exploring each of these questions, we aim to show that a multidimensional and complex understanding is required for effective policy discussions to confront the challenge of global warming. We engage the perspective of a miner and an environmental activist to illustrate the tensions relating to carbon pollution in an era of climate change, and in so doing we offer a parable for our carbon constrained world. We conclude by considering the implications of property rights for carbon for polluters, governments, people as individuals with a right to breathe clean air, as well as the global commons and other species.

Key Words: Carbon, pollution, land, ownership, property rights, value

Résumé

Ce document examine la signification de carbone en appliquant cinq grandes questions à cette substance controversée: ce qui est de la terre, ce qui est la propriété; quelle est la valeur, et ce sont les droits d'appropriation? En explorant chacune de ces questions, nous avons pour but de montrer qu'une compréhension multidimensionnelle et complexe est nécessaire pour les discussions politiques efficaces pour relever le défi du réchauffement climatique. Nous nous engageons la perspective d'un mineur et une environnementaliste pour illustrer les tensions liées à la pollution de carbone dans une ère de changement climatique et, ce faisant, nous offrons une parabole pour notre monde sous contrainte carbone. Nous concluons en examinant les implications des droits d'appropriation pour le carbone pour les pollueurs, les gouvernements, nous en tant qu'individus ayant le droit de respirer un air pur, ainsi que le patrimoine mondial et d'autres espèces.

Mots clés: carbone, pollution, terre, propriété, droits d'appropriation, valeur

Resumen

Este artículo revisa el significado de carbono mediante la aplicación de cinco preguntas generales a esta sustancia polémica: ¿cuál es la tierra, lo que es la propiedad, lo que es la propiedad, lo que es valor, y cuáles son los derechos de propiedad? Al explorar cada una de estas preguntas, tratamos de mostrar que un entendimiento multidimensional y complejo se requiere para la discusión política eficaz para enfrentar el reto del calentamiento global. Hacemos participar a la perspectiva de un minero y un activista del medio ambiente para ilustrar las tensiones relativas a la contaminación de carbono en una era de cambio climático y, al hacerlo, le ofrecemos una parábola de nuestro limitado mundo de carbono. Y concluimos considerando las implicaciones de los derechos de propiedad de carbono para los contaminadores, los gobiernos, nosotros como individuos con derecho a respirar aire limpio, así como el patrimonio común y otras especies.

Palabras clave: carbono, contaminación, tierra, propiedad, derechos de propiedad, valor