COMMENTARY

Carbon Property Rights in Context

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This commentary offers a background to the carbon challenge, carbon offsets, and emissions trading from an Australian perspective. It sets the scene for a more detailed discussion about carbon sequestration rights, which are defined explicitly by some Australian states and territories but not by others. We highlight that the term *carbon sequestration right* is poorly defined and relies, inappropriately we suggest, on the borrowed term profit *à prendre*. This terminology is at odds with the notion of a carbon property right, which has yet to be conceptualized fully by the marketplace and the existing legal framework, given the need to fully engage the sociological and ecological dimensions of carbon and climate change. We find that current policy intent, together with evolving public will and corporate responsibility, is ahead of the science and the legal framework for managing property rights in carbon (used broadly to represent the six greenhouse gasses). The Australian Property Institute has taken the lead in its 2007 policy paper *Conceiving Property Rights in Carbon* and more recently in Sheehan and Kanas's investigation of "Property Rights in Soil." This article takes the discussion to the next stage by offering a framework for property rights in carbon and asking whether such rights should be vested in the state or the nation, rather than merely creating a commodity that can be efficiently allocated and thus speculated upon.

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This article presents an analysis of the real property rights issues involved in designing and implementing a carbon cap and trade system in the context of Australian policy. It highlights the tension between the legal and economic interpretations of real property rights, particularly in the context of a new property right in carbon as the underlying asset in a carbon pollution reduction scheme (CPRS).

In the first section of the article, we offer a background to the carbon challenge, carbon offsets, and emissions trading. This sets the scene for a more detailed discussion in the second section about carbon sequestration rights (CSRs), which are defined explicitly by some Australian states and territories but not by others. The state of Victoria, for example, takes the term to mean the "right to commercially exploit carbon sequestered by trees. More generically a carbon sequestration right could be described as a class of property right (generally recognized under common law or statute) that recognises the existence of, and right of ownership to, carbon sequestered in a particular area of land and/or vegetation" (Australian Greenhouse Office, 2005, p. 51).

In the third section, we analyze the results in Australia. We highlight that the term carbon sequestration right is poorly defined and relies, inappropriately we suggest, on the borrowed legal precedent of profit *à prendre*. This precedent is at odds with the notion of a carbon property right, which has yet to be fully conceptualized by the marketplace and the existing legal framework, given the need to fully engage the sociological and ecological dimensions of carbon and climate change. We find that existing property law is vexed and often embedded over metaphors such as the "bundle of rights" to explain a normative view of property. This is strange, given that "the categories of interests in land are

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not closed. They change and develop as society changes and develops" (Butt, 1999, p. 235).

The article concludes with lessons from the Australian experience and implications for other countries. Our findings support the case for change, and we recommend that the way forward for carbon property rights is through a reconstitution of property as a "web of interests."

The Carbon Challenge

Human activity often gives rise to unwanted by-products. There is a growing awareness of how anthropogenic (human-induced) activity—burning of fossil fuels, deforestation, and urbanization—is contributing to a sharp and continuing rise in the emissions of greenhouse gases. There is a growing acceptance that the consequence of the increasing carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) accumulating in the earth's atmosphere is causing a rise in average global surface temperature: global warming. The effect of the accumulation and increase in these gases is not only referred to as *global warming* but also as *climate change* because the effects manifest as much more than just a change in temperature. They are also seen to include regional changes in precipitation, rising ocean levels, the deterioration of coastal reefs, increased intensification of droughts, flooding, major storms, and species extinction.

In identifying the causes of and cures for climate change, scientists cite the way in which CO_2 and the other greenhouse gases are trapped in the atmosphere. They highlight the way in which this can be mitigated through the development of clean energy sources that do not emit these gases, the conservation and reduction of energy use, and the absorption of CO_2 and other gases through ocean, earth, and forest *sinks*. From *social* and *economic* perspectives, the roots lie in the incentives facing individuals, firms, markets, and governments. Our lifestyles engage activities that contribute to climate change, such as the heating up of our homes with an electric heater in winter, cooking a meal on a stove, turning on a light, and driving a car. In doing so, we impose a small social and economic cost on the world population that adds to a larger cumulative cost—the inundation of coastal areas by rising ocean levels, the increase in insurance claims that result from the increase in severity of storms, the loss of life due to drought, and the spread of disease.

For a long time, the costs associated with our greenhouse gas–emitting lifestyles have remained invisible, not only to individuals responsible for their emission but also governments and industry. Likewise, no one has paid for the carbon gases they emit, nor have the companies that produce electricity, or companies that provide our cars or flights around the world. Australia is a country whose current standard of life—filled with cars, air-conditioners, cooking appliances, and aspirations of international holidays—results in a population that contributes significantly more to carbon emissions (per capita) than any other nation (United Nations Geographic Working Group, 2007).

Prior to our knowledge of global warming, we put CO_2 and other greenhouse gases into the atmosphere because there was no incentive not to. We were under the misapprehension that the increasing emissions associated with our lifestyles were not at the expense of the planet, and only saw the benefits from the energy services that generate carbon emissions. We were unwittingly set on a course of environmental catastrophe that could only end in the tragedy of our global commons, to borrow the terminology popularized by Garrett Hardin (1968). The notion of a *tragedy of the commons* revolves about the principle that a group of people sharing common access to a natural resource (in this case the broader environment) will tend to overexploit it, unless they can develop effective governance frameworks—through the development of social norms and formal governance structures—to regulate the use of the resource. Over the last decade, in an attempt to avert a tragedy of the commons of global proportions, many individuals, communities, societies, corporations, and all levels of government are beginning to participate in a growing variety of voluntary and mandatory mechanisms/schemes aimed at abating carbon emissions. The terms *carbon abatement*, *low carbon*, *carbon reduction*, *carbon neutrality*, and *carbon sequestration* have entered our lexicon and become the new buzzwords of environmental prudence. Carbon and other greenhouse gases are no longer being viewed as somebody else's problem, but as exploited waste products that need to be managed and controlled for a "global public good"—everyone benefits from carbon emission abatement, irrespective of whether everyone in society contributed to it or not.

Individuals and communities are beginning to seek out opportunities to reduce their *carbon footprint*. Corporations are seeking out opportunities to provide these individuals and communities with the opportunity to "live a low carbon life" and reduce their own carbon footprint. A

whole industry has emerged around the production of *carbon neutral* and *zero emission* products, energy sources, and services:

Lend Lease, for example, is currently working to create the *zero emission home.*

The expectation of a *carbon-neutral home loan* is being mooted by the mortgage industry.

The Australian Stock Exchange has sought to provide consumers with the opportunity to invest in *carbon friendly* companies through their *sustainable investment market.*

Carbon Offsets and the Kyoto Protocol

One of the key mechanisms that has emerged in an attempt to abate carbon emission is *carbon offsetting*—the process of reducing and/or counterbalancing carbon gas emissions by purchasing credits from others through emission-reduction projects or carbon-trading schemes. The term often refers to voluntary acts arranged by a commercial carbon-offset provider. Such schemes, of course, address the symptoms of environmental pollution rather than tackling the underlying cause.

Carbon offsetting is enabled through the purchase of *rights* over sequestered carbon (also known as a carbon sink), a protocol that is aimed at compensating for the emissions of harmful gases such as CO_2. Sequestered carbon is produced through the process of *carbon sequestration*, which can be understood as the removal and storage of carbon from the atmosphere into carbon sinks—such as oceans, forests, or soils—through physical or biological processes, such as photosynthesis. The ability of sinks and carbon *reservoirs* to remove greenhouse gases from the atmosphere has been recognized by the United Nations Framework Convention on Climate Change (UNFCCC) as an important means of reducing anthropogenic interference of the climate system (UNFCCC, Article 4.1[d]). *Photosynthesis* is a process that combines atmospheric CO_2 with water, subsequently releasing oxygen into the atmosphere and incorporating carbon atoms into the cells of plants (Sedjo, 2001). For example, trees convert the gas CO_2 to carbon by photosynthesis. The carbon is then stored in the leaves, branches, roots, and trunks of the trees.

In his first act after being sworn in as prime minister of Australia, Kevin Rudd signed the instrument of ratification of the Kyoto Protocol on December 3, 2007, demonstrating his government's commitment to tackling climate change. On March 17, 2008, Senator the Honorable Penny Wong, Minister for Climate Change and Water, set out the Australian federal government's detailed timetable for the introduction of emissions trading, which is scheduled to commence in 2010.

The objective of the Kyoto Protocol is to stabilize and reduce greenhouse gas emissions, mitigate climate change, and promote sustainable development. Importantly in the context of this article, the Kyoto Protocol clearly defines (at FCCC/CP/2001/13/Add.1 pp. 54–63) the nature the nature of land use, land-use change, and forestry that can be used as a carbon sink for sequestration purposes (UNFCCC, 2001). Eligible activities relate to direct *human-induced* afforestation (on land that has not been forested in the previous 50 years), reforestation (replanting land that has been converted to nonforest uses), and/or deforestation (conversion of forests to nonforested land) activities that have occurred since 1990. The protocol's "additionality clause" ensures that the establishment of carbon trading cannot count unless it is additional to anything that would occur otherwise. Under Kyoto Protocol rules, only the verifiable sequestration that occurs during the five-year commitment period (2008–12), can be counted to meet national greenhouse reduction targets (Australian Greenhouse Office, 2005, p. 10). This means that the sequestration in established preexisting (pre-1990) forest cover will become part of the national estate, and in developed (Annex I) countries carbon sequestration rights as offsets will have commercial value only as tradable property rights in post-1990 planting projects. However, Sedjo (2001) highlights that situation relating to deforestation is less clear in developing countries where the problem of deforestation is significant. If the Kyoto Protocol subsequently recognizes protection and conservation of forests in developing countries (Annex B nations), which may otherwise be destroyed for economic reasons, there would be scope to generate commercial value in carbon sequestration credits.

Emissions Trading

Given the earlier success of the sulfur dioxide (SO_2)-trading program in the United States, emissions trading has become a framework for climate-change reductions. Three carbon-trading markets have been especially prominent (Hepburn, 2007):

The mandatory European Union's Emissions Trading System (EU-ETS)

The New South Wales Greenhouse Gas Abatement Scheme (GGAS)

The voluntary Chicago Climate Exchange (CCX)

Federal, state, and territory governments in Australia are currently exploring a national emissions-trading scheme (NETS) that is to begin operating in 2010 as an effective policy response to ensure a flexible way of achieving greenhouse gas abatement in the transition to a carbon-constrained future (Council for the Australian Federation, 2007). The focus on carbon trading as a means of addressing carbon-emission abatement by governments was considered as far back as 1992 with the engagement in carbon taxes (i.e., higher taxes on the use of fossil fuels), the elimination of subsidies to wasteful energy use, and the development of renewable energy resources (*Financial Times*, 1992).

The use of carbon offsetting and carbon trading as mechanisms to abate carbon emissions is underpinned by the Coasian solution for the tragedy of the commons—the clear assignment of property rights by "privatizing the commons and trading the resulting property rights" (Hepburn, 2007, p. 376). The Coasian solution puts faith in private bargaining. Let us contextualize this in Hardin's (1968) parable of the Tragedy of the Commons. If the property rights to carbon are divided among individuals, then each individual will have proper economic incentives to manage those property rights wisely. Of course, privatizing property rights (in this case, carbon sequestration rights) is not the only solution, and this is something that requires recognition. For example, as already alluded, there is scope for local communities and individuals to manage their own emission of carbon through social norms and customs of stewardship (well-being and collective planetary guardianship) rather than through private property rights. The emergence of voluntary carbon-neutral communities in the United Kingdom (UK), such as Ashton Hayes Parish, provides a key example (Ashton Hayes Parish Council, 2008). Ostrom (1990) provides a detailed discussion of common-property resources and the evolution of institutions for collective action, grounded on a vast body of research on community-level natural resource management.

Meanwhile, in Australia, a billion-dollar industry is emerging around the selling of private carbon rights to large corporations or individuals wishing to become carbon neutral. State governments within Australia are preparing to reap millions of dollars in duty from dealings in carbon rights (Salusinszky and Shanahan, 2007). To give certainty to this burgeoning exchange market in carbon property rights, a broad range of standards[1] and legal frameworks are being developed around what carbon rights are, what constitutes an ethical carbon-trading system, and how to fix or understand the sequestered carbon within biota that is the focus of carbon property rights.

Carbon Sequestration Rights

All Australian states now have legislation to define *carbon sequestration rights* (CSRs), recognizing sequestered carbon as a property right that can be bought and sold, and that is protected through registration on freehold land title, if desired. The Australian Greenhouse Office (2005) uses the term CSR for convenience. It is used in New South Wales, where the Carbon Right Legislation Amendment Act 1998, inserted the provisions for the creation and ownership of CSRs in the Conveyancing Act 1919. In Victoria and South Australia, the term *forest property agreement* is used for sequestration rights. In Victoria, the Forestry Rights (Amendment) Act 2001 amended the Forestry Rights Act 1996 to provide rights to the commercial exploitation of carbon sequestered by trees. Forest property agreements were established in South Australia under the Forest Property Act 2000 and refined under the Forest Property (Carbon Rights) Amendment Act (Commencement) Proclamation 2007. West Australia uses the term *carbon right* under the Carbon Rights Act 2003. In Tasmania, registration of land title of certain forestry rights, including those to carbon sequestration, is embraced by the term *forestry right* under the Forestry Rights Registration Act 1990. Queensland amended the Forestry Act 1959 with the Forestry and Land Title Act 2001 to create *natural resource products* as CSRs. Interestingly, the *statist* nature of Australia results in the Northern Territory and the Australian Capital Territory not currently having CSR-specific legislation.

However, the loosely stitched seams of legislation, regulation, and standards that are holding the notion of carbon property rights and their trading together are beginning to feel the tension. For example, environmental campaigners in the UK recently called for tougher government action after questions were raised over a high-profile carbon offsetting project. The Rolling Stones and the car firm Volvo were among those who have paid thousands of pounds in the belief it was for trees to be planted at Orbost Forest on Skye. It transpired that the trees were already being planted through government grants and what participants in the scheme actually purchased were uncertain *carbon rights* to the trees (Edwards, 2007). *Caveat emptor* has to be the

watchword for purchasers of carbon rights. Within Australia, property owners organized by the self-styled Commonwealth Property Protection Association are engaging in carbon *civil disobedience* campaigns—threatening to chop down trees—currently under federal court actions, in an attempt to win the right for compensation for (perceived) forfeited carbon rights on private property (Manning, 2007).

In the postsignatory era of the Kyoto Protocol, *carbon neutral* has become a competitive marketing slogan for a diversity of consumer products and experiences in Australia. With a proliferation of carbon-footprint calculators (some 500 at the time of writing), the Australian Competition and Consumer Commission launched an inquiry into the Trade Practices Act and carbon offset claims in January 2008 to investigate cases of misrepresentation (Commonwealth of Australia, Australian Competition and Consumer Commission, 2008).

In the face of rising green litigation in Australia, the finance and business sectors, as well as the legal profession, have been calling for a clearer understanding of carbon property rights, based on the established assumption and expectation that Australia is uniquely placed to develop the rights associated with carbon sequestration into a major source of income (Elias, 1999). This, of course, is easier said than done, given that we face a broad range of fundamental legal, social, and scientific questions about what a carbon property right is, let alone how to calculate sequestration levels in forest sinks accurately (for a comprehensive review of the literature on the valuation of net carbon sequestration, see Venn 2005). Likewise, the science about sequestered carbon in soil and other forms of biota is still dubious (Sheehan and Kanas, 2008), requiring considerable further research (Dumanski, 2004) particularly in respect of the time dynamics of soil carbon responses to land use changes and soil-plant interactions (García-Oliva and Masera, 2004).

Vexed Property Law in Australia

The decision of the High Court of Australia in the watershed judgment *Mabo & Ors v. Queensland* (No. 2)[2] (*Mabo*) resulted in a subsequent profound reexamination of established notions of property rights in Australia. The existing matrix of proprietary interests in land under Anglo-Australian law has, since *Mabo*, been slowly reshaped to respond to emerging freestanding property rights such as water and, now, carbon. This is at odds with other jurisdictions. As Gray and Gray (2005, p. 60 [1.107]) highlight, "although the ownership of water promises to become one of the critical questions of the 21st century, English law persists in regarding water as incapable of being owned." Meanwhile in the United States, surface water is typically viewed as a form of private property in the West, but not so in the east of the country (for a comprehensive treatise on property in water, see Zellmer and Harder, 2007).

It is accepted that land tenure is a human construct, adapted and developed over time to best serve the needs of the (dominant) stakeholders. Australia has been flexible in adapting to the politics of changing societal expectation after *Mabo*, in the context of property rights both in water and more recently in carbon. As detailed previously, state legislation, in preparation for carbon trading, has recently evolved to engage with the notion of carbon sequestration rights in forest sinks. Currently, the legislation in each state "only establishes a basic framework for the creation and ownership of CSRs. This State legislation does not deal with maintenance of the sequestered carbon, liability issues, the allocation of risk between the parties, or the methodology to calculate or quantify the sequestered carbon. These matters must all be dealt with in a contract between the parties" (Australian Greenhouse Office, 2005, p. 9). As the representative professional valuation body whose members will be expected to be arbiters of value for these evolving rights, the Australian Property Institute (API) have responded through their policy paper: *Conceiving Property Rights in Carbon* (API, 2007).

In exploring the carbon property rights conundrum, we must investigate what the term *carbon sequestration right* intends. The conceiving of a separate property right in carbon out of the inchoate land-property right is a task that requires the vesting in an individual or corporations' rights in a post-1990 afforestation or reforestation carbon sink. Butt (1999, p. 235) highlighted the "intriguing possibility of one person 'owning' trees which stand on another person's land. Arguably, such an arrangement was possible at common law, but the potential complexities to which it could give rise would make the title to the land intricate in the extreme." This statement raises the commonly misunderstood notion of "ownership."

Although a full exploration of property *ownership* is beyond the scope of this article, it is sufficient to highlight that what is owned is a property right, or multiple property rights, pertaining to the enjoyment or income stream emanating from a particular parcel of land. In an attempt

to explain this concept, the metaphor of a *bundle of rights*, akin to a bundle of sticks, has been perpetuated to describe property (a metaphor that is well explained, and contested, by Arnold, 2002). However, this metaphor overlooks that rights cannot be taken in isolation, and the reality (much to the libertarians' chagrin) is that with rights come obligations and restrictions (for a fuller explanation, see Lyons, Davies, and Cottrell, 2007). The "bundle" metaphor is normative, overlooking the attributes of the property and commonly failing to address the multiple levels of importance of property in relation to human communities (stakeholders) and ecology (Zellmer and Harder, 2007).

In his more recent work, Butt (2006, p. 491) expands the view to identify that a forestry right can also include a "carbon sequestration right" for the legal, commercial, or other present or future benefit for a forest sink. As we already explained, limited statutory rights in vegetation have been created in the Australian states, and in New South Wales, South Australia, Tasmania, and Queensland carbon sequestration rights in forests have been legislated to be treated as a profit *à prendre* and hence a property right (albeit a limited legal right). The Commonwealth of Australia has already identified this significant limitation:

> While it may be possible to categorise a right to sequestered carbon as a profit *à prendre*, the common law concept of a profit *à prendre* is a right to take something from another's land and has typically covered such things as crops, timber, soil, minerals or animals on the land. This may be inconsistent with ownership rights to carbon sequestration, as sequestration does not involve taking anything from the land. Rather, it involves putting something into the land, i.e. the carbon. (Australian Greenhouse Office, 2005, p. 12)

Generally, within Australia, under the prevailing legislation of the states the opportunity for CSRs applies only to land classified under the Torrens Title system and excludes (with some state exceptions) protection to "old law"-system land, Crown land, and pastoral leases. There is, however, scope for the respective Australian states, with ministerial consent, to register a forestry right, which means that a carbon sequestration right could be registered. This raises a range of moral and economic issues in respect of the stewardship of the national estate, given that much native vegetation in Australia grows on state land. The notion of separating the carbon as a right from the broader web of rights over a parcel of the land, and the vegetation growing thereon, raises the intriguing reaffirmation of the *feudal doctrine of tenure* (Rogers, 1995, p. 184) in *Mabo* rather than *res communes*, a common law public property regime. Such a public or common-property regime reveals that the state is merely in the position of trustee for the public (p. 197), and, arguably, this regime correctly recognizes the true position of the state in Australia.

The High Court of Australia, in seeking comfort in feudal tenures in 1992 sits contrary to the reality that Parliament is arguably the only source of any authority for beneficial ownership of property by the state, as observed long ago in 1847 in argument in *Attorney General (NSW) v.* Brown:[3] "[I]t was boldly asserted ... that the Crown has not and never had any property in the waste lands of the Colony—that is, any beneficial ownership or right to grant any of them without authority of Parliament" (at 316). The importance of the argument in *Attorney General (NSW) v. Brown* is that, rather than a land tenure system with the Crown as the paramount feudal lord, the Australian colonies in reality oversaw a system of allodial ownership. Such a system constitutes absolute beneficial ownership of property in the hands of the owner without reference to any superior. The owner in such cases has *absolutum et directum dominium*. Hence, if the state is to grant private property rights in carbon, such action raises important conceptual difficulties within a public or common-property regime. It creates a situation whereby the owner of superior property rights over the private land property holds the vegetation in which another party holds rights to the carbon credits over the vegetation that is being sequestered or, in the absence of alienation, held by the state as trustee for the public.

In a world of limited goods and attenuated altruism, it is inconceivable that the commonwealth could excise from the private land–property right any rights in carbon without violating the *just terms* provision of the Australian Constitution (para. 51[xxxi]). The broad ambit of this constitutional provision was established in *Bank of NSW v. Commonwealth*,[4] where it was stated that

> s51(xxxi) is not to be confined pedantically to the taking of title by the Commonwealth to some specific estate or interest in land recognized at law or in equity and to some specific form of property in a chattel or chose in action similarly recognized, but that it extends to innominate and anomalous interests and includes the assumption and indefinite continuance of exclusive possession and control for the purposes of the Commonwealth of any subject of property. (at 349)

Those interests that are described as *innominate* and *anomalous* reveal that the notion of property in the context of *just terms* extends well beyond formal land tenures and arguably covers any legal relationship in a thing. As discussed in *Smith v. ANL Limited*,[5] "[W]hat has been acquired

may often be without any analogue in the law of property and incapable of characterisation according to any established principles of property law" (at 157).

This represents a substantial barrier to attempts by the Commonwealth of Australia, or the commonwealth in conjunction with the states, to gain rights over carbon. However, the commonwealth identifies that

> in the Northern Territory, the legislation dealing with Pastoral leases expressly reserves all timber. This means that the Northern Territory owns the trees and has the right to enter the land and take the trees. This would obviously be inconsistent with the rights of the investor who would need to obtain agreement from the Northern Territory that it would not exercise its rights in respect of the trees the subject of the CSR Agreement. (Australian Greenhouse Office, 2005, p. 65)

There are also issues over the state or territory *ownership* of mineral rights in respect of carbon in CSRs, although such an aspiration was previously shown to be flawed in the 2001 Bio Prospecting Inquiry. However, the committee in that inquiry did open the door on the opportunity for evolving appropriate property rights to address changing circumstances: "[E]conomic growth can be facilitated by well defined property rights and the creation of new ones, particularly where they are nationally consistent" (Commonwealth of Australia, 2001, p. 32, sect. 3.38).

The situation is compounded when the interests of indigenous stakeholders are added to the equation. Adding complexity to the situation of the commonwealth and the states is the presence of indigenous property rights in vegetation, which are protected by the Native Title Act 1993 (Cth.). The prospect of excision of rights in carbon by the Commonwealth or the States from their own land raises the specter of extinguishment or impairment, and hence a right to compensation by the traditional owners. It is known that general environmental laws can exist only on land within which native title has survived if such laws "are capable of operating concurrently with native title rights and interests" (Hughes, 1995, p. 42). Such complexities have not gone unnoticed by the Australian Greenhouse Office (2005, p. 15):

> In relation to carbon sink projects, acts that enable a carbon sink to be created—such as the creation of a new legal interest in land, such as a new lease, or the upgrade of an existing interest—may be acts that affect native title. If a new legal interest is created or the terms of a lease altered to allow for the carbon sink, it is possible that the requirements of the Native Title Act will need to be followed.

Finding a Way Forward: Lessons from the Australian Context

We conclude with lessons from the Australian experience and implications for other countries. This article has highlighted that, when new circumstances emerge, political catalysts (e.g., Australia ratifying the Kyoto Protocol) and political aspirations (e.g., the Rudd government's detailed timetable for introduction of emissions trading) often move at a faster pace than the science or the development of appropriate nationally consistent property rights to underpin the whole process.

There are no guarantees that a new Kyoto Protocol–appropriate forest will be permanent and only broad speculation that the CO_2 released back into the atmosphere when the trees die and rot away will be adequately compensated by new growth (Milmo, 2007). These scientific problems contribute to the fundamental legal problem that Australia currently lacks a clear, nationally consistent definition of a *carbon property right* (API, 2007, p. 5). Statist politics have seen the development of partially, and variously, defined carbon *sequestration* rights within Australian states (not territories). These *sequestration* rights have inappropriately drawn reliance on established, but inappropriate, legal frameworks such as the weak concept of profit *à prendre*. Without a clear definition of carbon property rights, obligations, and restrictions, we are left, as the Australian Greenhouse Office (2005) recommends, with a need for individualized contracts in every case to address issues of duration, insurance, felling, forest management, and subsequent alienation. Such a situation creates a lack of state or commonwealth certainty and will inevitably fill the courts for decades to come. There are also the social dimensions of carbon property rights that need to be considered—such as who should be allowed to *own* carbon property rights and the ensuing questions: are they an individual right, a right you can purchase or allocate, a right that is held by countries or industry? In the face of all this scientific, social, and legal uncertainty about the future direction of carbon property rights, what is needed is a new way to conceive of the complex web of interests.

Firstly, we do not have to accept the assumption that carbon property rights must be built into the existing limiting framework of Australian property rights. We need to come to terms with the consequences of isolating carbon property rights from the unfortunate metaphor of "bundle of rights" that currently make up Australian property law. Sheehan and Small (2005), among others, have drawn our attention to the complex issues and conflicts that can emerge

when the "bundle of sticks" that we call Australian property rights is unraveled.

Secondly, in developing a viable carbon-trading market in Australia, as the API (2007) has noted, we need to develop certainty about carbon property rights. Uncertainty could force carbon traders to look overseas due to the need for surety of ownership and value of carbon assets, albeit there is little evidence of the complex legal framework being more thought through in other jurisdictions. Work needs to be done at a national level to unravel the complex issues surrounding property rights in carbon. A rigorous carbon property rights regime is essential for traders to have confidence in a future trading scheme. In doing this, the API has identified three key factors that would help support the establishment of a vibrant carbon trading market in Australia. The first is the creation of a statutory definition of a carbon property right (as opposed to a carbon sequestration right). Second is the establishment of a permanent register of the existence and ownership of carbon property rights guaranteed by the commonwealth (API, 2007, p. 5). A carbon title register is seen as a key tool that could prevent the disputes and uncertainty that are currently arising about carbon property rights compensation. This is critical where, for example, large sums of money are spent acquiring a level of sequestration right over trees that make up a Kyoto Protocol–approved forest, with superior title to the land belonging to someone else. The final API recommendation is for the government to commission further scientific work to enable definitive data to be available to the marketplace regarding carbon sequestration in order to underpin the valuation challenges relating to the economic worth of rights, both as investments and in transfer.

Finally, our article has alluded to a third dimension that needs to be addressed in the formation of a framework for carbon property rights: the sociological and ecological values, in addition to formal legal mechanisms such as legislation, were identified as part of the governance framework that is being used to abate carbon gas emissions.

There is a way forward that has the potential to engage with, and resolve, the issues that we have raised. Prior scholarship into property rights and environmental 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"(Arnold, 2002, p. 283). We realize that such language is at odds with the High Court's finding in *Yanner v. Eaton*,[6] which determined that "property does not refer to a thing ... [which is usually] treated as a 'bundle of rights.'"

We find hope in Arnold's view that 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, p. 283). Arnold stresses the importance of the object of the property interests, whether tangible or intangible. He argues that the time has come for property theorists to "reconstitute property" to engage with the sociological and ecological, which was the third finding of our article. 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." We agree with Gray and Gray (2005, p. 5) that "there was nothing inevitable about the eventual shape of modern land law." They draw on *Western Australia v. Ward*[7] to make the point that "radical change has... been a part of the development of property law" (Gray and Gray, 2005, p. 4). Given that social values and legal directions change, sometimes quite dramatically as they have done in Australia after *Mabo*, there is a need to step beyond embedded legal frameworks to reconceptualize property interests in order to meet changing conditions. The need to respond laterally to the development of carbon property rights is a prime example.

A web of property interests needs to be distinctive, interconnected, functional, and have context. Arnold's metaphor sees the web as "a set of interconnections among persons, groups, and entities, each with some stake in an identifiable (but either tangible or intangible) object, which is at the center of the web. All of the interest-holders are connected both to the object and to one another" (Arnold, 2002, p. 333).

Implications for Other Countries

By conceptualizing carbon property rights as the object at the center of the web, or indeed a *constellation*, there is scope to focus on the "nature and characteristics of the object of the property interests, the relationship between interest holders and the object, and the relationship amongst interest holders, including societies stake in the object" (Arnold, 2002, p. 364). This approach interprets property as vital, distinctive, adaptive, and functional, as well as inte-

grative with and between stakeholders. It would appear to be our best way forward for carbon property rights.

The notion of a property right in carbon as a subclass of biota property rights raises the unpalatable specter of an internecine clash between legal rights within the bundle of rights. Such clashes are, however, not unknown in property theory and law. The High Court's vision of the bundle of rights is of a disproportionate power accruing to some rights in the bundle, resulting in a capacity to dominate others. Carbon property rights are a creature of the common law. As such, common law will attempt to characterize this emergent tenurial interest in terms of the characteristics of other established tenures in the Australian property-law system. This article reveals that there is an inherent susceptibility within the "bundle of rights" for some legal rights to be favored over other rights. As the common law and statute law currently stand, this susceptibility in the case of carbon is arguably a fatal limitation to the prospect of establishing a true freestanding property right in carbon.

Notes

1. For example, see International Organization for Standardization (ISO) 14001 environmental standards. The ISO 14000 environmental management standards exist to help organizations minimize how their operations negatively affect the environment (cause adverse changes to air, water, or land) and comply with applicable laws and regulations. ISO 14001 is the international specification for an environmental management system (EMS). Also see Australian Standard 4978, which provides a common approach to determining how much carbon a given area of forest can be expected to remove from the atmosphere, taking account of the species of tree, how densely the trees are planted, and a number of other factors.
2. (1992) 175 CLR 1.
3. Cf. (1847) 1 Legge Rep 312.
4. (1948) 76 CLR 1.
5. (2000) HCA 58.
6. (1999) 201 CLR 351 (Yanner).
7. (2000) 170 ALR 159 at 362 per North J.

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