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An introduction to the Carbon Farming Initiative: Key principles and concepts

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Abstract

In December 2011, the Australian Government introduced a project-based, baseline-and-credit carbon offset certification scheme called the Carbon Farming Initiative (CFI). The scheme is one of the broadest and most comprehensive domestic offset schemes of its type in the world. Its formal objectives are to assist in the achievement of Australia's greenhouse gas mitigation obligations and promote abatement in a manner that will protect the environment and improve resilience to the effects of climate change. Most significantly, the CFI will provide the basis for the generation of certified offsets for use in the Australian carbon pricing scheme under the Clean Energy Act 2011 (Cth) (CE Act) and for sale to overseas buyers. It will also certify domestic offsets for use in voluntary markets. This article describes and analyses key aspects of the CFI and sheds light on its relationship with the international greenhouse accounting rules and the CE Act's carbon pricing scheme. It also evaluates the effectiveness of the mechanisms that have been put in place to deal with integrity risks and secondary impacts associated with the scheme. It is concluded that the CFI has the capacity to significantly reduce the cost of meeting Australia's mitigation targets and promote more sustainable land-management practices. The realisation of this potential will rely heavily on how broad regulation-making and administrative discretions are exercised and whether there are sufficient incentives for landholders to participate in the scheme.

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INTRODUCTION

In the lead up to the Australian federal election in 2010, the Gillard Labor Government announced that, if re-elected, it would establish a statutory-based carbon offset scheme called the Carbon Farming Initiative (CFI).[1] The Government presented the CFI as offering a 'win-win' opportunity for farmers and the environment. Landholders would be able to generate offset credits for certain activities that reduced greenhouse gas emissions, or increased the removal of carbon from the atmosphere, and these credits could then be sold on domestic and international markets. In the words of the Australian Labor Party (ALP), '[f]armers and landholders will benefit from a new income stream, and the environment will benefit from reduced pollution'.[2]

After a public consultation process and two Parliamentary inquiries, the *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) (CFI Act) was passed by Parliament in August, received Royal Assent on 15 September and commenced on 8 December 2011. In general terms, the CFI Act has established a project-based, baseline-and-credit offset certification scheme. In plain English, this means that the scheme allows for the creation and certification of offsets on a project-basis, where the quantity of offsets for each project is determined against a counterfactual baseline (or reference level). Theoretically, the baseline should be a projection of what the net emissions or removals from the activity would have been in the absence of the project. Generally, if net emissions are below the baseline, the proponent receives credits (called Australian carbon credit units, or 'ACCUs') equal to the baseline minus the actual net emissions, with each ACCU representing 1 tonne of carbon dioxide equivalent (CO_2-e) abated. Because the program is voluntary, proponents do not incur a penalty if the emissions from the project exceed the baseline, other than the opportunity cost associated with lost credits.

Prior to the enactment of the CFI Act, the generation and authentication of offsets was governed by the National Carbon Offset Standard that was introduced in July 2010 and, before that, the Greenhouse Friendly program. It is anticipated that the National Carbon Offset Standard will continue to operate in tandem with the CFI and provide a process for companies wanting to voluntarily achieve carbon neutrality.[3] However, the CFI will provide the basis for the generation of certified offsets for use in the Australian carbon pricing scheme under the *Clean Energy Act 2011* (Cth) (CE Act) and for sale to overseas buyers. It will also certify domestic offsets for use in voluntary markets, including those utilising the National Carbon Offset Standard.

This article describes and analyses key aspects of the CFI. The object is to shed light on how it is likely to function and its relationship with the international greenhouse accounting rules and the CE Act's carbon pricing scheme. It also evaluates the effectiveness of the mechanisms that have been put in place to deal with integrity issues and secondary impacts. Section 2 discusses the theory of offsets and their role

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[1] Australian Labor Party, *Carbon Farming Initiative* (2010) ALP <http://www.alp.org.au/agenda/environment/carbon-farming-initiative/> at 6 February 2012.
[2] Ibid.
[3] Explanatory Memorandum, Carbon Credits (Carbon Farming Initiative) Bill 2011 (Cth) 8; Department of Climate Change and Energy Efficiency (DCCEE), *National Carbon Offset Standard* (2011) DCCEE <http://www.climatechange.gov.au/government/initiatives/national-carbon-offset-standard.aspx> at 23 February 2012.

in mitigating emissions. Section 3 describes the CFI and reviews its linkages with the international accounting rules and CE Act. Sections 4 and 5 analyse the integrity and secondary impact mechanisms, and section 6 concludes.

THE THEORY OF OFFSETS

Carbon offsets can be defined in the broadest sense as reductions in emissions, or the maintenance or enhancement of carbon sinks, relative to a counterfactual reference case, which can be used to compensate for emissions from another source.[4] Typically, the undertaking of an offset project leads to the creation of a tradable permit or credit that can be used by another party for voluntary purposes (e.g. voluntary carbon neutrality) or to meet a mandatory pollution liability (e.g. under an emissions trading scheme or approval condition).

The origins of the idea of using offsets to manage environmental impacts can be traced to the works of Arthur Pigou, William Baumol and Wallace Oates on environmental taxes, and early research on tradable permit schemes by the likes of John Dales and W. David Montgomery.[5] Reduced to its most simple, the chief contention of these economists was that market-based instruments (e.g. taxes and tradable-permit schemes) are the most cost-effective means of achieving environmental objectives because they are likely to lead to an outcome where the marginal abatement cost for all polluters is equal. If polluters' marginal abatement costs are the same, by definition, the total social costs of achieving a given pollution objective are minimised.

From these theoretical developments it was a short step to offsets. Schemes that include offsets allow polluters with mandatory emission reduction or pricing requirements to pay others to cut their emissions and to use these reductions to meet their regulatory obligations. By facilitating trade between polluters, offset schemes can lower net social abatement costs. The United States Environmental Protection Agency was one of the first to act on this simple insight, moving in the early 1970s to incorporate offsets into its emissions trading program for air pollutants under the *Clean Air Act of 1970*.[6] Not long after, wetland mitigation offset credits and wetland mitigation banking were introduced as part of the regime for controlling wetland impacts under the U.S. *Water Pollution Control Act of 1972*.[7] From there, offsets

[4] Liese Coulter, Josep Canadell and Shobhakar Dhakal, *Carbon Reductions and Offsets* (2008) Global Carbon Project <http://www.globalcarbonproject.org/global/pdf/ReportSeries/GCP_Report_No.6.pdf> at 27 February 2012; Jenna Goodward and Alexia Kelly, *The Bottom Line on Offsets* (2010) World Resources Institute <http://pdf.wri.org/bottom_line_offsets.pdf> at 27 February 2012.

[5] Arthur Pigou, *The Economics of Welfare* (1920); William Baumol and Wallace Oates, 'The use of standards and prices for protection of the environment' (1971) 73 *Swedish Journal of Economics* 42; John Dales, *Pollution, Property and Prices: An essay in policy-making and economics* (1968); W. David Montgomery, 'Markets in licenses and efficient pollution control programs' (1972) 5(3) *Journal of Economic Theory* 395.

[6] Robert Hahn, 'Economic Prescriptions for Environmental Problems: How the Patient Followed the Doctor's Orders' (1989) 3(2) *Journal of Economic Perspectives* 95; Robert Hahn and Gordon Hester, 'Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Program' (1989) 6 *Yale Journal on Regulation* 109.

[7] Deborah Mead, 'History and Theory: The Origin and Evolution of Conservation Banking' in Nathaniel Carroll, Jessica Fox and Ricardo Bayon (eds.), *Conservation and Biodiversity Banking: A Guide to Setting Up and Running Biodiversity Credit Trading Systems* (2008) 9.

blossomed and have become a standard feature of environmental management and regulation throughout the western world.[8]

Greenhouse gas emissions have several characteristics that lend themselves to offsets. There are several different types of greenhouse gases that can be converted into a single unit — carbon dioxide equivalents (CO_2-e) — using global warming potentials (GWPs).[9] These gases are emitted from a range of activities, some of which are amenable to regulation and others that are not. Political and equity issues hinder the introduction of optimal policy approaches, both domestically and internationally. Moreover, the anthropogenic influence on the carbon cycle is not confined to the release of greenhouse gases from sources; human activities also influence the removal of carbon from the atmosphere by sinks.

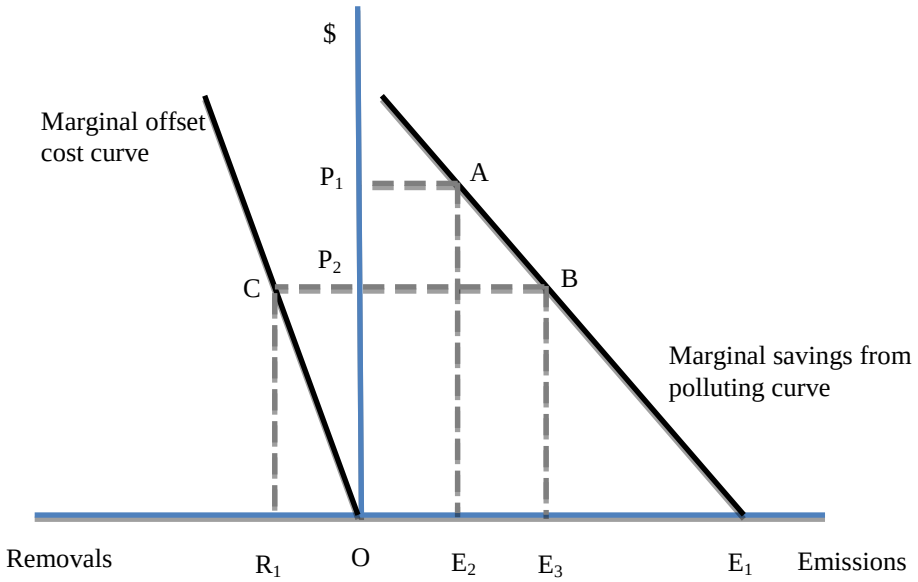
The theoretical operation of sink-based offsets (or biosequestration offsets) is illustrated in Figure 1. In this hypothetical example, in the absence of policy intervention, emissions would be E_1, where the marginal savings from polluting is zero (the marginal savings curve is the inverse of the marginal abatement curve). Society then decides to cap emissions at the level E_2, requiring emissions to be reduced by the amount $E_1 – E_2$. Assuming an emissions trading scheme is used to achieve this target, and that no offsets are allowed, the price of permits will be P_1 and the total social cost of achieving the emissions target is the area of the triangle E_2AE_1. The introduction of biosequestration LULUCF offsets creates opportunities for gains from trade; the marginal cost of abating emissions between points B and A on the marginal savings curve is greater than the marginal cost of supplying offsets between points 0 and C on the marginal offset cost curve. In theory, the introduction of offsets

[8] Leila Suvantola, 'Regulatory concerns regarding the NSW BioBanking Scheme' (2009) 13(1) *Australasian Journal of Natural Resources Law & Policy* 113; Susie Brownlie and Mark Botha, 'Biodiversity offsets: adding to the conservation estate, or 'no net loss'' (2009) 27(3) *Impact Assessment and Project Appraisal* 227; Phillip Gibbons and David Lindenmayer, 'Offsets for land clearing: No net loss or the tail wagging the dog?' (2007) 8(1) *Ecological Management & Restoration* 26; David Farrier, Andrew Kelly and Angela Langdon, 'Biodiversity offsets and native vegetation clearance in New South Wales: The rural/urban divide in the pursuit of ecologically sustainable development' (2007) 24 *Environmental and Planning Law Journal* 427; Paul Curnow and Louise Fitz-Gerald, 'Biobanking in New South Wales: Legal issues in the design and implementation of a biodiversity offsets and banking scheme' (2006) 23 *Environmental and Planning Law Journal* 298; United Nations Environment Programme, *The Use of Economic Instruments in Environmental Policy: Opportunities and Challenges* (United Nations Environment Programme, 2004); Kerry ten Kate, Josh Bishop and Ricardo Bayon, *Biodiversity offsets: Views, experience, and the business case* (International Union for Conservation of Nature and Natural Resources, and Insight Investment, 2004); Michael Young et al, *Reimbursing the Future: An evaluation of motivational, voluntary, price-based, property-right, and regulatory incentives for the conservation of biodiversity* (Commonwealth of Australia, 1996); David Farrier, 'Conserving biodiversity on private land' (1996) 19(2) *Harvard Environmental Law Review* 304.

[9] The conversion of emissions into CO_2-e using GWPs is not without controversy. Most of this stems from the fact that the gases do not have the same atmospheric lifetime or, in the case of CO_2, do not have a single atmospheric lifetime. Due to this, the choice of time interval alters the GWP and has ramifications for the impacts and cost-effectiveness of different abatement strategies. Piers Forster et al, 'Changes in Atmospheric Constituents and in Radiative Forcing' in Susan Solomon et al (eds), *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, 2007) 129; Detlef van Vuuren et al, 'Exploring IMAGE model scenarios that keep greenhouse gas radiative forcing below 3 W/m^2 in 2100' (2010) 32 *Energy Economics* 1105; Detlef van Vuuren, John Weyant and Fransisco De la Chesnaye, 'Multigas scenarios to stabilise radiative forcing' (2006) 28 *Energy Economics* 102.

should result in the permit price falling to P_2, while the total social cost of achieving the emissions target will be reduced to the area $E_3BE_1 + R_1C0$. As a consequence, the use of biosequestration offsets results in the same amount of abatement ($E_1 – E_2 = E_1 – E_2 – R_1$) but at a lower cost. This is the primary theoretical benefit of all offsets.

Figure 1 Hypothetical LULUCF biosequestration offsets



FUNDAMENTALS OF THE CFI

The CE Act, equivalent carbon prices and the CFI

The CFI was designed to work in conjunction with the CE Act's carbon pricing scheme. At a general level, the carbon pricing scheme is a cap-and-trade emissions trading scheme with a three-year fixed-price phase-in period. During the first three years (1 July 2012 to 30 June 2015), the Clean Energy Regulator will issue an unlimited number of carbon units at a fixed price to liable entities. In 2012-13, the fixed price will be A$23 per carbon unit and it will increase by 5% (2.5% real increase plus 2.5% for inflation) in the following two years (i.e. the 2013-14 price will be $24.15 and the 2014-15 price will be $25.40). Liable entities will be required to surrender 'eligible emissions units' to cover their scheme liability, comprising carbon units, eligible international emissions units and eligible ACCUs. The scheme liability of each liable entity will generally be calculated on the basis of the covered Scope 1 emissions released by the entity in the relevant financial year, which will be determined on the basis of the information submitted by liable entities under the *National Greenhouse and Energy Reporting Act 2007* (Cth).

At the completion of the fixed charge period, the carbon pricing scheme will convert into a standard cap-and-trade emissions trading scheme, where there will be a cap on the number of carbon units issued by the Clean Energy Regulator (called the 'carbon pollution cap') and the price of carbon units will be determined by the market. During

the ‘flexible charge’ years, carbon units will be able to be banked (i.e. put aside for use in future periods), traded and borrowed from future periods.[10]

The scheme will cover CO_2, methane (CH_4), nitrous oxide (N_2O), and perfluorocarbon (PFC) emissions from four sectors: stationary energy, industrial processes, non-legacy waste and fugitive emissions from mines (with the exception of emissions from decommissioned underground coal mines).[11] The Government estimates that it will directly cover 60% of Australia’s emissions, as accounted for under the Kyoto Protocol.[12] While it is the most comprehensive greenhouse gas emissions trading scheme ever introduced, a number of sources and sinks have been excluded from its reach, including CH_4 and N_2O emissions from agriculture, emissions and removals associated with land use, land-use change and forestry (LULUCF), legacy emissions from landfill facilities (i.e. emissions attributable to waste deposited at the facility before 1 July 2012) and emission from landfill facilities closed prior to 1 July 2012, emissions from the use of transport fuels, fugitive emissions from decommissioned coal mines, and hydrofluorocarbon (HFC), sulfur hexafluoride (SF_6) and non-aluminium PFC emissions.

To reduce the distortions caused by these exclusions, ‘equivalent carbon prices’ will be imposed on two excluded sources. First, the fuel tax system has been altered to impose an equivalent carbon price on certain uses of transport fuels.[13] Second, an equivalent carbon price will be imposed on synthetic greenhouse gases via changes to the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* (Cth) and related legislation (OSGG).[14]

The CFI is the third major limb in the Australian Government’s mitigation strategy.[15] It is intended to aid in the achievement of Australia’s mitigation commitments by filling some of the gaps left by the CE Act, fuel-tax system and OSGG regime, while

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[10] Borrowing is subject to a 5% cap and liable entities are only allowed to surrender carbon units with a vintage 1 year after the relevant financial year. *Clean Energy Act 2011* (Cth), ss 122, 133.

[11] *Clean Energy Act 2011* (Cth) s 30. The coverage of PFC emissions is confined to those from the aluminum sector: *Clean Energy Act 2011* (Cth), s 30(12).

[12] Explanatory Memorandum, above n3, 33. *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, open for signature 16 March 1998, 37 ILM 22 (entered into force 16 February 2005) (‘Kyoto Protocol’).

[13] *Clean Energy (Fuel Tax Legislation Amendment) Act 2011* (Cth), *Clean Energy (Excise Tariff Legislation Amendment) Act 2011* (Cth) and *Clean Energy (Customs Tariff Amendment) Act 2011* (Cth) amend the *Fuel Tax Act 2006* (Cth), *Excise Tariff Act 1921* (Cth) and *Customs Tariff Act 1995* (Cth). The fuel tax scheme works by imposing fuel tax under the *Excise Tariff Act 1921* (Cth) (for domestically manufactured fuels) and *Customs Tariff Act 1995* (Cth) (for imported fuels). Fuel tax credits are then granted under the *Fuel Tax Act 2006* (Cth), which remove or reduce the incidence of fuel tax from business inputs so that fuel tax falls primarily on consumers and business use of light commercial vehicles. The equivalent carbon pricing arrangements reduce the fuel tax credits granted to business by an amount equal to the carbon price, thereby effectively increasing the price of fuel.

[14] *The Clean Energy (Consequential Amendments) Act 2011* (Cth), *Ozone Protection and Synthetic Greenhouse Gas (Manufacture Levy) Amendment Act 2011* (Cth) and *Ozone Protection and Synthetic Greenhouse Gas (Import Levy) Amendment Act 2011* (Cth) amend the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* (Cth), *Ozone Protection and Synthetic Greenhouse Gas (Manufacture Levy) Act 1995* (Cth) and *Ozone Protection and Synthetic Greenhouse Gas (Import Levy) Act 1995* (Cth).

[15] There are also a suite of federal renewable energy policy instruments that contribute to the mitigation effort, including the Large-Scale Renewable Energy Target, Small-Scale Renewable Energy Scheme and the Clean Energy Finance Corporation. They are not discussed here because they are primarily directed towards industry assistance/technological development rather than mitigation.

also providing an incentive for offset projects in sectors that do not count towards Australia's mitigation targets. In contrast to the mandatory carbon pricing mechanisms, the CFI provides a voluntary incentive for emission reductions and enhanced removals from agriculture, legacy waste and LULUCF activities. A simplified outline of the coverage of the CE Act, fuel tax adjustments, OSGG and the CFI is provided in Table 1.

Table 1 Coverage of the CE Act, fuel tax adjustments, OSGG and the CFI

CE Act	Fuel tax	OSGG	CFI
Carbon pricing scheme liabilities apply to CO_2, CH_4, and N_2O emissions from: • stationary energy; • industrial processes; • non-legacy waste; and • fugitive emissions from mines. PFC emissions from aluminium production are also covered by the scheme. The general rule is that a person will only be liable if they have operational control of a facility that emits ≥25,000 t CO_2-e yr^{-1}. The emissions that count towards the threshold are all scope 1 (direct) emissions covered by the scheme, plus legacy emissions from landfill facilities and exempt landfill emissions (i.e. emissions from waste deposited while the entity was not a liable entity for the purpose of the scheme). The scheme includes a voluntary opt-in mechanism that allows large users of liquid petroleum fuels (e.g. airlines) to opt into the scheme rather than facing an equivalent carbon price.	An equivalent carbon price will be imposed on the following via the fuel tax system adjustments. • Off-road transport use of liquid and gaseous fuels, other than in relation to agriculture, fisheries and forestry. • Non-transport use of liquid and gaseous fuels. • Use of liquid and gaseous fuels in domestic aviation, domestic shipping and rail transport. The Government has stated that it intends to apply an effective carbon price to heavy on-road transport from 1 July 2014.	An equivalent carbon price will be imposed on the manufacture and importation of HFCs, PFCs and SF_6, and the importation of equipment containing HFCs, PFCs and SF_6, through the OSGG regime. The Minister now has a discretion to wave the OSGG levy, including the equivalent carbon price component, in prescribed circumstances, which include instances where the gases are used in medical equipment.	The following are covered by the CFI. 1. "**Sequestration projects**" = projects to store CO_2 in living biomass, dead organic matter (deadwood or litter) or soils. This might include: • reforestation and revegetation; • avoided deforestation, native forest harvesting and de-vegetation; • improved vegetation management on forest management lands, croplands and grazing lands; and • enhanced soil carbon on croplands and grazing lands. 2. "**Emissions avoidance projects**" = projects that seek to reduce CH_4 and N_2O emissions from: • agricultural activities (livestock, rice production, and savanna and crop residue burning); • feral animals; and • legacy waste in landfill facilities.

Source: CE Act; EM, Clean Energy Bill 2011 (Cth); CFI Act; EM, Carbon Credits (Carbon Farming Initiative) Bill 2011 (Cth).

CFI and the Kyoto Protocol's accounting rules

The meaning of agriculture, waste and LULUCF activities is derived from the Kyoto Protocol and its reporting and mitigation obligations. At a general level, the Kyoto Protocol works through a targets-and-timetables structure, whereby a limit is placed on the net emissions of Kyoto gases (CO_2, CH_4, N_2O, SF_6, PFCs and HFCs) from developed (Annex B) countries over the commitment period.[16] The underlying principle of the accounting framework is that parties are supposed to be responsible for all *anthropogenic* emissions and removals within their *territory*.[17] This is known as the production, or territorial, approach.[18] To give effect to this principle, the Protocol requires Annex B countries to account for emissions from five so-called Annex A sectors: energy, industrial processes, solvent and other product use, agriculture and waste.[19] They are also required to account for emissions and removals from certain LULUCF activities under Article 3.[20]

Agricultural emissions comprise CH_4 and N_2O emissions from agricultural activities and include such things as CH_4 emissions from enteric fermentation and rice cultivation, N_2O emissions from agricultural soils, and CH_4 and N_2O emissions from the prescribed burning of savannas and field burning of agricultural residues.[21] In Australia, agriculture is the second largest source of emissions behind energy and represents approximately 15% of the national total.[22] Waste emissions represent a much smaller proportion of the national total, around 2.5%, and are made up mostly of CH_4 emissions from the decomposition of solid waste in landfill.[23] They also cover emissions associated with wastewater treatment and handling (predominantly CH_4) and waste incineration, where the largest component consists of the burning of waste containing fossil carbon (e.g. plastics). If fossil carbon waste is used as fuel in energy generation, either via direct combustion or fuel production, the associated emissions are reported in the energy sector. Any waste-related CO_2 emissions from biogenic sources are reported in the LULUCF sector or are not reported at all (this occurs where the corresponding biosequestration removal is not accounted for). CO_2

[16] Kyoto Protocol, open for signature 16 March 1998, 37 ILM 22, arts 3–4 (entered into force 16 February 2005); Brendan McGivern, 'Conference of the Parties to the Framework Convention on Climate Change: Kyoto Protocol' (1998) 37 *International Legal Materials* 22; Michael Grubb, Christiaan Vrolijk and Duncan Brack, *The Kyoto Protocol: A Guide and Assessment* (1999).
[17] United Nations Framework Convention on Climate Change (UNFCCC), opened for signature May 29, 1992, 1771 UNTS 107 (entered into force March 24, 1994), Article 4(1)(b); Simon Eggleston et al, *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (2006).
[18] The alternative 'consumption approach', whereby countries would be responsible for the emissions embodied in the goods and services consumed within their territory, was rejected in the early 1990s on the grounds it was unworkable. Jesper Munksgaard and Klaus Pedersen, 'CO_2 accounts for open economies: producer or consumer responsibility?' (2001) 29 *Energy Policy* 327; Glen Peters and Edgar Hertwich, 'Post-Kyoto greenhouse gas inventories: production versus consumption' (2008) 86 *Climatic Change* 51.
[19] Kyoto Protocol, open for signature 16 March 1998, 37 ILM 22, arts 3–4 (entered into force 16 February 2005).
[20] Ibid.
[21] DCCEE, *National Inventory Report 2009* (2011); Eggleston et al, above n 17.
[22] DCCEE, *National Greenhouse Gas Inventory: Accounting for the Kyoto Target – December Quarter 2010* (2011).
[23] Ibid.

emissions from biogenic waste-to-energy activities are reported as an information item in the energy sector, meaning they do not count towards the national total.[24]

Accounting for LULUCF is done on an activity basis and, during the Protocol's first commitment period (2008-12), these activities were grouped under two Articles:

- Article 3.3 activities — afforestation, reforestation and deforestation — for which reporting was compulsory; and
- Article 3.4 activities — forest management, revegetation, cropland management and grazing land management — for which reporting was voluntary.[25]

An overview of these activities is provided in Table 2.

[24] The CO_2 emissions and removals are reported in the LULUCF sector or not reported at all, depending on LULUCF coverage. DCCEE, above n 21, DCCEE, above n 22; Eggleston et al, above n 17.

[25] Kyoto Protocol, open for signature 16 March 1998, 37 ILM 22, arts 3–4 (entered into force 16 February 2005); *Marrakesh Accords*, Decision 16/CMP.1, FCCC/KP/CMP/2005/8/Add.3 (2006); Bernhard Schlamadinger et al, 'A synopsis of land use, land-use change and forestry (LULUCF) under the Kyoto Protocol' (2007) 10 *Environmental Science & Policy* 271.

Table 2 Article 3.3 and 3.4 LULUCF activities

Article 3.3 activities	Definition and comment
Afforestation/ reforestation	The direct human-induced conversion of land that was not forested on 31 December 1989 to forest by planting, seeding and/or the human-induced promotion of natural seed sources. Technically, there is a distinction between afforestation and reforestation, the former involving land that has not been forested for a period of at least 50 years. This distinction is of no consequence in the operation of the rules. In the first commitment period, the 'harvest sub-rule' applied to lands subject to reforestation/afforestation, which prevented net debits being recorded against these land units over the 2008-12 period.
Deforestation	The direct human-induced conversion of land that was forest on 31 December 1989 to a non-forest land use after 1 January 1990. Once a land unit has been deforested, the party must account for all subsequent emissions and removals from the land, even if they are non-anthropogenic (e.g. natural regrowth, wildfires, regrowth clearing and insect attacks). The same principle applies to all other Article 3.3 and 3.4 activities, subject to the operation of the harvest sub-rule.
Forest management	A system of practices for stewardship and use of forest land aimed at fulfilling relevant ecological (including biological diversity), economic and social functions of the forest in a sustainable manner. This definition has two potential meanings, a narrow and a broad. With the narrow approach, the party can define a set of specific practices (e.g. harvesting, thinning, fertilization and fire suppression) and the FM lands are those subject to these practices since 1990. The broad approach to FM requires the party to define a system of FM practices and identify the area subject to these practices in the commitment period. Parties can use a mix of these narrow and broad approaches.
Revegetation	Direct human-induced activity to increase carbon stocks on sites through the establishment of vegetation that covers a minimum area of 0.05 hectares and does not qualify as reforestation/afforestation.
Cropland management	The system of practices on land used for livestock production aimed at manipulating the amount and type of vegetation and livestock produced.
Grazing land management	The system of practices on land on which agricultural crops are grown and on land that is set aside or temporarily not being used for crop production.

Sources: *Marrakesh Accords*, Decision 16/CMP.1, FCCC/KP/CMP/2005/8/Add.3 (2006).

When accounting for the Article 3.3 and 3.4 LULUCF activities, Annex B countries are required to identify the lands subject to the relevant activities and account for changes in five carbon pools (aboveground biomass, belowground biomass, dead wood, litter, and soil organic carbon) and non-CO_2 emissions occurring on these lands.[26] Because of the coverage of the carbon pools, LULUCF is the only reporting sector that includes removals from sinks. All other sectors only report emissions from sources. The other major difference between LULUCF reporting and the rules that apply to the other sectors is that LULUCF is not counted in the base year emissions estimates for the purposes of calculating parties' assigned amounts (with the exception of deforestation emissions in countries with net emissions from LULUCF

[26] Kyoto Protocol, open for signature 16 March 1998, 37 ILM 22, arts 3–4 (entered into force 16 February 2005); *Marrakesh Accords*, Decision 16/CMP.1, FCCC/KP/CMP/2005/8/Add.3 (2006); Jim Penman et al, *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (2003) 4.30.

in the base year).[27] Net LULUCF emissions are only added to those from non-LULUCF sectors during the commitment period in the form of Removal Units (RMUs);[28] that is, they operate as offsets.[29]

Article 3.3 LULUCF activities have played a crucial role in meeting Australia's obligations under the Kyoto Protocol. This is due mainly to the quirk in the LULUCF rules (Article 3.7(2), euphemistically known as the 'Australia clause') that allows countries with net LULUCF emissions in the base year to include deforestation emissions when calculating its emission target. Australia was able to take advantage of this provision and include 132 Mt CO_2-e of deforestation emissions in its base year, 1990. As deforestation emissions have fallen since 1990 — due to a combination of climatic, market, geographic and regulatory factors — Australia will receive a deforestation 'offset' worth approximately 80 to 100 Mt CO_2-e yr^{-1} during the first commitment period.[30] This offset is the primary reason Australia will achieve, and in fact exceed, its first commitment period emission target of 108% on 1990 levels. Reforestation will provide a further 22-23 Mt CO_2-e yr^{-1} of offsets and add to Australia's surplus from the period 2008-12.[31] Due to concerns about natural disturbances (i.e. droughts and wildfires), Australia chose not to account for any Article 3.4 activities in the first commitment period.[32]

The CFI's coverage of agriculture, waste and LULUCF is not complete. This can be seen in Table 3, which shows the coverage of the CE Act, fuel-tax adjustments, OSGG and the CFI against the sectors that count towards Australia's Kyoto targets. The CFI potentially covers all reported agricultural and LULUCF activities but waste projects are confined to solid 'legacy' waste deposited in landfill facilities (or emissions from waste accepted prior to 1 July 2012). Table 4 includes Article 3.4 activities for completeness. As indicated, while these activities do not currently count towards Australia's national total, they are covered by the CFI.

A question that stems from the CFI's coverage is: why not subject agriculture, legacy waste and LULUCF activities to a mandatory carbon price like most other sectors? The answer lies in a mix of transaction costs, measurement problems, equity issues and politics. These sources and sinks are diffuse and involve a large number of actors. Imposing a carbon price on emitters would greatly increase the number of liable entities under the CE Act, with an accompanying increase in administration and other transaction costs. The emissions and removals from these sectors are also notoriously

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[27] Kyoto Protocol, open for signature 16 March 1998, 37 ILM 22, art 3(7) (entered into force 16 February 2005).

[28] Kyoto Protocol, open for signature 16 March 1998, 37 ILM 22, arts 3(3)–3(4) (entered into force 16 February 2005); *Marrakesh Accords*, Decision 16/CMP.1, FCCC/KP/CMP/2005/8/Add.3 (2006).

[29] JI includes the same LULUCF activities as are reported by Annex B countries. The CDM's coverage of LULUCF in the first commitment period is more limited, being restricted to afforestation and reforestation projects. This has been a source of controversy because it excludes deforestation and forest degradation, even though deforestation alone accounted for 15% of global carbon emissions over the period 1990-2010. Glen Peters et al, 'Rapid growth in CO_2 emissions after the 2008-2009 global financial crisis' (2012) 2 *Nature Climate Change* 2.

[30] Andrew Macintosh, 'The Australia clause and REDD: a cautionary tale' (2011) *Climatic Change*, doi: 10.1007/s10584-011-0210-x.

[31] DCCEE, Australia's Emissions Projections 2010 (2011); DCCEE, above n 22.

[32] Australian Government, *Land Use, Land-Use Change and Forestry (LULUCF) Sector: Submission to the AWG-KP and AWG-LCA* (2008) 3; DCCEE, above n 21.

difficult and expensive to measure.[33] Simplified estimation methods that use uniform emission factors are an option but they can diminish the incentives to change behaviour. For example, if the enteric fermentation emissions from cattle are estimated using a single emission factor, there is no incentive for farmers to change their management practices to reduce the emissions. In relation to legacy waste and LULUCF activities that enhance biosequestration, a major driver was fairness; it was seen as inequitable to impose a carbon price on these activities. Political factors were also prominent. The government initially intended to include agriculture within the carbon pricing scheme but dropped it when pressed by the Opposition in 2009.[34] The agriculture and forestry sectors have considerable political influence and the final package reflects the extent of it — both their direct emissions and off-road transport emissions are totally excluded from the carbon pricing arrangements and several grant programs were created to help landholders take advantage of carbon trading opportunities and to adapt to the impacts of climate change.[35]

[33] Hugh Saddler and Helen King, *Agriculture and Emissions Trading: The impossible dream?* (2008); Macintosh, above n 30; DCCEE, above n 21.

[34] Australian Government, *Carbon Pollution Reduction Scheme: Australia's Low Pollution Future* (2008) 6-46.

[35] The grant programs include the Biodiversity Fund ($946 million over six years), the Carbon Farming Futures Program ($429 million over six years), Australia's Farming Future Program ($130 million over four years) and the Regional Natural Resource Management Planning for Climate Change Fund ($44 million over five years). Australian Government, *Securing a Clean Energy Future* (2011).

Table 3 Kyoto accounting rules and the CE Act, fuel tax adjustments, OSGG regime and the CFI

Reporting sector and category	Mt CO_2-e (2009)	CE Act	Fuel tax	OSGG regime	CFI
1. Energy					
A. Fuel combustion					
1. Energy industries	227.8	✓	×	×	×
2. Manufacturing industries and construction	44.5	✓	×	×	×
3. Transport	83.6	×	✓	×	×
4. Other sectors	20.3	✓	×	×	×
5. Other (not otherwise classified)	1.4	✓	×	×	×
B. Fugitive emissions					
1. Solid fuels	28.7	✓	×	×	×
2. Oil and natural gas	11.0	✓	×	×	×
2. Industrial processes	29.6	✓	×	✓	×
3. Solvent use	NA	NA	NA	NA	NA
4. Agriculture					
A. Enteric fermentation	54.7	×	×	×	✓
B. Manure management	3.3	×	×	×	✓
C. Rice cultivation	0.05	×	×	×	✓
D. Agricultural soils	14.2	×	×	×	✓
E. Prescribed burning of savannas	12.1	×	×	×	✓
F. Field burning of agricultural residues	0.3	×	×	×	✓
5. LULUCF					
A. Afforestation/reforestation	-22.6	×	×	×	✓
B. Deforestation	41.3	×	×	×	✓
C. Article 3.4 activities	NA	×	×	×	✓
5. Waste					
A. Solid waste disposal on land	11.0	✓	×	×	✓
B. Wastewater handling	3.0	✓	×	×	×
C. Waste incineration	0.03	✓	×	×	×
Total (including LULUCF)	564.5	NA	NA	NA	NA

Source: DCCEE, above n 22.

Sequestration and emissions avoidance projects, and Kyoto and non-Kyoto offset projects

As noted in Table 1, there are two types of offset projects under the CFI Act: sequestration projects and emissions avoidance projects. At the simplest level, sequestration projects involve the sequestration of CO_2 in biomass or soils and avoidance of CO_2, CH_4 and N_2O emissions from the destruction or disturbance of biomass or soils. Emissions avoidance projects involve the avoidance of CH_4 and N_2O emissions from agricultural activities, feral animals and legacy waste in landfill facilities.

The CFI Act also differentiates between projects on the basis of whether the associated removals or avoided emissions can be used to meet Australia's mitigation commitments under the Kyoto Protocol or a successor agreement. 'Kyoto offsets projects' are those where the associated removals and/or avoided emissions can be

counted towards Australia's mitigation targets.[36] These projects lead to the generation of 'Kyoto ACCUs', which are eligible emissions units for the purposes of the CE Act (i.e. they can be used to meet liabilities under the carbon pricing scheme).[37] Kyoto ACCUs can also be exchanged for Kyoto units — Assigned Amount Units (AAUs), Emission Reduction Units (ERUs) or RMUs — and sold to foreign buyers.[38] In the Australian Treasury's *Strong Growth, Low Pollution* report of 2011, it was assumed that, in the absence of a carbon pricing scheme, all Kyoto ACCUs would be exported into foreign compliance markets.[39]

'Non-Kyoto offsets projects' are those where the associated removals and/or avoided emissions cannot be counted towards Australia's targets.[40] They generate 'non-Kyoto ACCUs', which are not eligible emissions units under the CE Act and cannot be converted into Kyoto units, effectively meaning that they can only be traded in voluntary carbon markets. The trading volumes and carbon prices in voluntary markets are generally well below those in compliance markets.[41] Consequently, there may be little incentive for landholders and others to undertake non-Kyoto offset projects. In recognition of this, the Australian Government has established an 'ongoing' Carbon Farming Initiative non-Kyoto Carbon Fund, comprising $250 million over six years from 1 July 2012, for the purpose of purchasing these units. The explicit intent of this fund is to ensure there is a source of demand for non-Kyoto ACCUs.[42]

The relationship between sequestration and emissions avoidance projects, and Kyoto and non-Kyoto offset projects, is summarised in Table 4.

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[36] Individual projects can have both Kyoto and non-Kyoto components. *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 55.
[37] *Clean Energy Act 2011* (Cth), s 5.
[38] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), ss 154, 157. See also *Australian National Registry of Emissions Units Act 2011* (Cth), ss 38, 41.
[39] Australian Treasury, *Strong Growth, Low Pollution* (2011) 60.
[40] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 55.
[41] Ricardo Bayon, Amanda Hawn and Katherine Hamilton, *Voluntary Carbon Markets: An International Business Guide to What They Are and How They Work* (2007); Katherine Hamilton et al, *State of the Voluntary Carbon Market 2007: Picking Up Steam* (2007); Katherine Hamilton et al, *Forging a Frontier: State of the Voluntary Carbon Markets 2008* (2007); Katherine Hamilton et al, *Fortifying the Foundation: State of the Voluntary Carbon Markets 2009* (2009); Katherine Hamilton et al, *Building Bridges: State of the Voluntary Carbon Markets 2010* (2010); Molly Peters-Stanley et al, *Back to the Future: State of the Voluntary Carbon Markets 2011* (2011).
[42] Australian Government, above n 35.

Table 4 Sequestration and emissions avoidance projects, and Kyoto and non-Kyoto offset projects

	Carbon sequestration	Emissions avoidance
Kyoto offset projects	Sequestration of CO_2 in biomass and avoidance of CO_2, CH_4 and N_2O emissions on lands subject to Article 3.3 activities (or that would be included in Article 3.3 lands but for the offset project) but confined to: "**reforestation projects**", defined as the direct human-induced conversion of non-forested land to forest by planting or seeding on land that was not forest on 31 December 1989; "**protection of native forest from deforestation**"; and "**establishment of vegetation on land that was subject to deforestation**" by seeding, planting or human-induced regeneration by way of exclusion of livestock, management of timing and extent of grazing, humane management of feral animals, management of non-native plants, or cessation of destruction or suppression of regrowth.	"**Agricultural emissions avoidance projects**", defined as projects to avoid: • CH_4 and N_2O emissions from savannah and grassland burning; • CH_4 and N_2O emissions from crop residue burning; • CH_4 and N_2O emissions from agricultural soils; • CH_4 emissions from the digestive tract of livestock; • CH_4 and N_2O emissions from livestock urine and dung; or • CH_4 emissions from rice production. "**Landfill legacy emissions avoidance projects**", defined as projects to avoid CH_4 and N_2O emissions from landfill but only to the extent that the emissions come from waste accepted prior to 1 July 2012
Non-Kyoto offset projects	Sequestration of CO_2 in biomass and avoidance of CO_2, CH_4 and N_2O emissions on lands subject to Article 3.4 activities (or that would be included in Article 3.4 lands but for the offset project).	"**Introduced animal emissions avoidance projects**", defined as projects to avoid: • CH_4 emissions from the digestive tract of introduced animals • CH_4 and N_2O emissions from urine and dung from introduced animals

Source: CFI Act, ss 5, 55; *Carbon Credits (Carbon Farming Initiative) Regulations 2011* (CFI Regulations), regs 1.3, 3.35.

The designation of projects as Kyoto or non-Kyoto is complicated by the state of the international negotiations. At the Durban Climate Conference in December 2011 (the 17th Conference of the Parties to the UNFCCC and 7th Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol), the Ad Hoc Working Group on the Durban Platform for Enhanced Action was established to negotiate, by 2015, a new international agreement to take effect in 2020.[43] The parties also reached agreement on LULUCF accounting rules for the second commitment period of the Kyoto Protocol, which will run from 1 January 2013 to either 31 December 2017 or 31 December 2020.[44] Relevantly, the new rules make forest management accounting compulsory through a baseline-and-credit system (often called 'reference levels') and place a cap on forest management credits and credits from Joint Implementation forest management projects equal to 3.5% of total base-year emissions excluding LULUCF. The revised rules also add a new activity under Article 3.4: wetland drainage and

[43] *Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action, CP.17* (2011) UNFCCC <http://unfccc.int/2860.php> at 27 February 2012.
[44] *Land use, land-use change and forestry, CMP.7* (2011) UNFCCC <http://unfccc.int/2860.php> at 27 February 2012.

wetting. The impact of these rules will depend on Australia's approach to the Kyoto Protocol, which, in turn, will be shaped by the positioning of other developed countries.

Prior to the commencement of the new international agreement, it is anticipated that developed countries will adopt a variety of approaches to accounting and mitigation commitments. The European Union is expected to participate in the Kyoto Protocol's second commitment period, as might Belarus, Croatia, Iceland, Kazakhstan, Lichtenstein, Monaco, Norway, Switzerland and the Ukraine.[45] Others, including the United States, Canada, Japan and Russia, are unlikely to participate in the second commitment period and will probably account for their medium-term mitigation commitments through the 'pledge-and-review' structure described in the Durban decisions.[46] The LULUCF rules they apply are likely to be derived from the Kyoto Protocol's accounting structure, with modifications made to suit in-country circumstances.

Given the fractured state of the international regime, and the uncertainty surrounding the arrangements that will apply over the period 2013-2020, Australia is faced with three options: (a) participate in the Kyoto Protocol's second commitment period and adhere to the new LULUCF rules; (b) do not participate in the second commitment period but still apply the new LULUCF rules; or (c) do not participate in the second commitment period and apply an alternative LULUCF accounting structure. At present, it is unclear which of these options Australia will choose. In the lead up to the Durban Climate Conference, the Australian Government indicated that it would not enter into a second commitment period of the Kyoto Protocol unless all major emitters were covered by a new legal framework.[47] At this stage, this precondition has not been satisfied. The decisions made by the Australian Government on whether to participate in the second commitment period and what accounting rules to apply will shape the CFI and the division of projects between Kyoto and non-Kyoto (and may even prompt the renaming of the project types).

Generating ACCUs

There is a five-step process that has to be followed for projects to generate ACCUs. This process is summarised below.

Step 1: Approved methodology

The first step in generating ACCUs is for a methodology to be approved for the project. The methodology provides the basis for determining the number of ACCUs a project can generate. It can also set down specific requirements that proponents must meet concerning reporting, incident notification, record-keeping and monitoring. The methodology-determination process works through the Domestic Offsets Integrity Committee (DOIC), a statutory committee established under Part 26 of the CFI Act. Proponents can apply to the DOIC for the endorsement of a methodology, or the

[45] Evidence to Senate Environment and Communications Legislation Committee, Parliament of Australia, Canberra, 13 February 2012, 73 (Clare Walsh).
[46] *Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, CP.17* (2011) UNFCCC <http://unfccc.int/2860.php> at 27 February 2012.
[47] Greg Combet, 'Breakthrough at Durban Climate Change Conference' (Press Release, 11 December 2011).

DOIC can self-initiate an endorsement. In order to endorse a methodology, the DOIC must be satisfied that, if the Minister made a methodology determination to give effect to the proposal, the determination would comply with the 'offsets integrity standards' and the regulations, and that the method includes a process for the calculation of project baselines.[48] If the DOIC endorses a methodology, the Minister is then authorised to make a 'methodology determination', which sets out the requirements that projects must meet to be 'eligible offsets projects' and how the net abatement or net sequestration number is calculated for relevant projects.[49] The Minister's power to make methodology determinations is subject to several restrictions, including that the determination complies with the offsets integrity standards and regulations.[50]

Step 2: Recognised offset entity

To be eligible to generate ACCUs, the project proponent must be a 'recognised offset entity'. To become a recognised offset entity, the proponent must apply to the scheme administrator (the Clean Energy Regulator). It is at the discretion of the administrator to determine whether a person becomes a recognised offset entity, but the relevant tests focus on whether the proponent is a 'fit and proper' person and not insolvent or externally administered.[51]

Step 3: Project approval

The project proponent must apply to the Clean Energy Regulator for the project to be approved as an 'eligible offsets project'. In order to be approved:

- the applicant must be a recognised offset entity;
- the applicant must be the project proponent, meaning they must be responsible for carrying out the project, have the legal right to carry out the project, and hold the 'applicable carbon sequestration right' (essentially, the exclusive registered legal right to obtain the benefit of sequestration of carbon in the relevant carbon pools);[52]
- the project must meet the 'additionality test', which is supposed to ensure that credits are only issued in relation to abatement that would not have otherwise occurred;
- if the project is a sequestration offset project, all people with interests in the land must have consented to the application; and

[48] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 112.
[49] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 106.
[50] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 106(4).
[51] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 64.
[52] The requirement that the project proponent holds the applicable carbon sequestration right only applies to sequestration projects.

- the project must not be an excluded offsets project or a project involving the clearing of native forest or use of material obtained as a result of the clearing or harvesting of a native forest.[53]

Step 4: Reporting

After a project has been approved as an eligible offsets project, the proponent must select a reporting period of between 1-5 years and then submit offsets reports within three months of the end date of the nominated reporting period.[54] These reports are generally required to be audited, although the auditing requirements can be waived under the regulations.[55] The purpose of the reports is to provide the basis on which to determine the number of ACCUs that are credited for the project.

Step 5: Crediting

The final step is crediting, which is initiated by the proponent applying to the Clean Energy Regulator, after the submission of an offsets report, for a certificate of entitlement.[56] The certificate of entitlement must be issued if the Regulator is satisfied that, amongst other things:

- the applicant is a recognised offsets entity and the project proponent;
- the reporting period is included in the crediting period for the project; and
- all relevant regulatory approvals have been obtained.[57]

A certificate of entitlement specifies the 'unit entitlement' for the project. For sequestration projects, the unit entitlement is equal to the net abatement number (i.e. the amount of abatement calculated in accordance with the methodology) minus a risk of reversal buffer (generally 5%).[58] For emissions avoidance projects, the unit entitlement is simply the amount calculated in accordance with the methodology.[59] As soon as practicable after issuance of a certificate of entitlement, the Regulator must issue ACCUs equal to the unit entitlement.[60]

INTEGRITY MECHANISMS

Nature of the integrity risks

Despite the potential for offsets to lower abatement costs, their use is not universally supported. The primary reason is that traded offset credits do not always reflect real abatement. This is a product of four main integrity risks:

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[53] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 27.
[54] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 76.
[55] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 76(5).
[56] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 12.
[57] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 15.
[58] For 'native forest protection projects', the unit entitlement is equal to the net sequestration number minus the risk of reversal buffer. *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), ss 16, 17.
[59] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 18.
[60] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 11.

- additionality, which refers to the risk of offsets being issued for emission reductions or enhanced removals that would have occurred anyway;[61]
- leakage, which refers to the risk that the offset project will trigger an increase in emissions from sources, or reduction in removals by sinks, that occurs outside the project boundary;[62]
- measurement, which refers to the risk that the emissions and/or removals from offset projects will be measured inaccurately, thereby leading to the generation of invalid or false offsets;[63] and
- permanence, which only applies in relation to biosequestration offsets and refers to the risk that the carbon stored within the project area and credited under the scheme will be fully or partially released as a result of future events.[64]

Where offsets do not represent their face value in abatement (typically 1 t CO_2-e), it will usually result in a net increase in global emissions. Under the CFI, the impacts will depend on whether the units are Kyoto or non-Kyoto ACCUs. If the units are non-Kyoto ACCUs, and they are used to offset emissions from a source that does not count towards Australia's emission target, the failure to ensure additionality will ordinarily lead to increased emissions. In contrast, if the units are Kyoto ACCUs, and they are used to offset emissions from liable entities under the carbon pricing scheme, any additionality deficiencies should not increase absolute emissions. This is because Australia's mitigation commitments involve setting a cap on cumulative net national emissions for the period 2013-2020, and ultimately through to 2050.[65] Due to this limit, fluctuations in emissions and removals in sectors that count towards the national total will not usually affect the environmental outcome. Increasing or decreasing

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[61] Henning Rentz, 'Joint Implementation and the question of additionality: a proposal for a pragmatic approach to identify possible Joint Implementation projects' (1998) 4 *Energy Policy* 275; Kevin Baumert, 'The Clean Development Mechanism: understanding additionality' in Jose Goldemberg and Walter Reid (eds), *Promoting Development while Limiting Greenhouse Gas Emissions: Trends and Baselines* (1999); Kenneth Chomitz, *Evaluating Carbon Offsets from Forestry and Energy Projects: How Do They Compare?* (2000); Robert Watson et al (eds), *Land Use, Land-Use Change and Forestry* (2000) Intergovernmental Panel on Climate Change (IPCC) <http://www.ipcc.ch/ipccreports/sres/land_use/index.php?idp=0> at 27 February 2012; Sandra Greiner and Axel Michaelowa, 'Defining investment additionality for CDM Projects: practical approaches' (2003) 31 *Energy Policy* 1007; Lambert Schneider, 'Assessing the additionality of CDM projects: practical experiences and lessons learned' (2009) 9 *Climate Policy* 242; Emma Paulsson, 'A review of the CDM literature: from fine-tuning to critical scrutiny' (2009) 9 *International Environmental Agreements* 63.

[62] Technically, leakage could also involve reductions in emissions outside the project boundary. For the purposes of this article, the discussion of leakage is confined to risks of increased emissions. Chomitz, above n 61; Watson et al, above n 61; Brent Sohngen and Sandra Brown, 'Measuring leakage from carbon projects in open economies: a stop timber harvesting project in Bolivia as a case study' (2004) 34(4) *Canadian Journal of Forestry Research* 829; Gert Nabuurs et al, 'Forestry' in Bert Metz et al (eds), *Climate Change 2007: Mitigation of Climate Change* (2008); Ian Fry, 'Reducing Emissions from Deforestation and Forest Degradation: Opportunities and Pitfalls in Developing a New Legal Regime' (2008) 17(2) *Review of European Community and International Environmental Law* 166. See also *Marrakesh Accords*, Decision 9/CMP.1, FCCC/KP/CMP/2005/8/Add.2 (2006).

[63] Fry, above n 62; Macintosh, above n 30.

[64] Kenneth Chomitz, The Permanence and Duration Issue in Carbon Offsets (World Bank, Development Research Group, 1998); Till Neeff and Francisco Ascui, 'Lessons from carbon markets for designing an effective REDD architecture' (2009) 9 *Climate Policy* 306; Chomitz, above n 61; Fry, above n 62.

[65] The next accounting period after the end of the Kyoto Protocol's first commitment period could be 2013-2017, depending on the outcome from the international negotiations.

emissions in one sector should merely change the distribution of total emissions between sectors, countries or time. Put more plainly, if emissions in one sector fall, it will typically result in either a relative increase in emissions in another domestic sector, a relative increase in emissions by another country through the transfer of surplus units or a reduction in unit imports, or a relative increase in domestic emissions in a future time period through the carry-over of surplus units (and *vice versa*). Reductions in absolute emissions should only occur if a drop in emissions leads directly to the lowering of the national target (e.g. cancellation of assigned amount units or other equivalent units) or, in the event that national emissions end up being below the target in one accounting period, the Australian Government decides not to carry over the surplus into the next period.

As a result of the cap on net national emissions, the most significant impacts of issuing Kyoto ACCUs that do not represent their abatement face value relate to government revenues from the carbon pricing scheme and imports of foreign carbon units. These risks are best explained in reverse chronological order, starting with the point at which the carbon pricing scheme becomes a standard emissions trading scheme (1 July 2015). At this point, the carbon pollution cap under the scheme is likely to be determined by the equation:

$$CPC_t = NT_t - USE_t \quad (1)$$ [66]

Where:

CPC_t means the carbon pollution cap in year t (emissions covered by the carbon pricing scheme or the 'covered sector emissions');

NT_t means the national target in year t; and

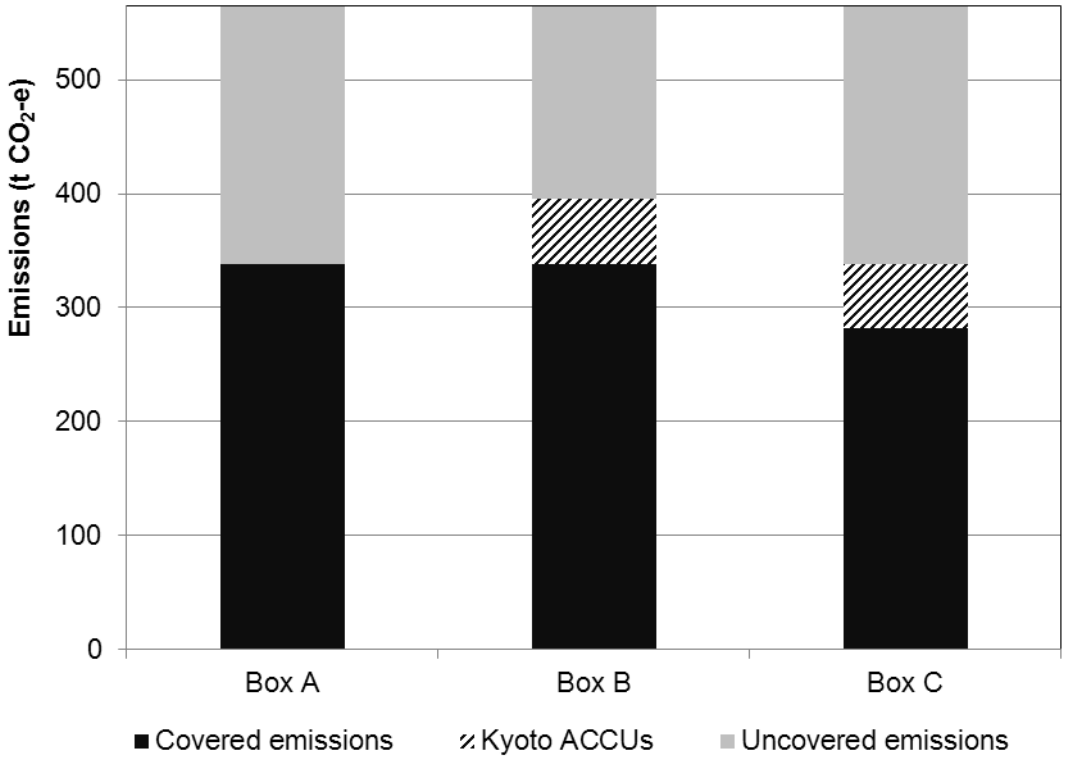
USE_t means the 'uncovered sector emissions' in year t (emissions and removals counted toward the national target but not covered by the carbon pricing scheme).

If ACCUs are issued under the CFI Act that do not represent their abatement face value, the carbon pollution cap under the CE Act (representing the emissions allowed from the sectors covered under the carbon pricing scheme) will have to be proportionally reduced. Failure to do so will result in Australia's emissions exceeding the national target, which the Government could be liable for under the international regime. This is illustrated in Figure 2. In this hypothetical illustration, Box A represents the case without the CFI, where covered emissions are shown in black and uncovered emissions in grey. In Box B, where only additional and otherwise valid Kyoto ACCUs are issued (represented by the diagonal lines), the covered emissions (i.e. the carbon pollution cap) are unchanged but the uncovered emissions are reduced on account of the abatement achieved via the CFI. In this instance, the revenues from the carbon pricing scheme are unaffected by the operation of the CFI Act because all ACCUs represent their face value in abatement. In Box C, none of the Kyoto ACCUs

[66] Technically, net LULUCF credits (debits) are added to (subtracted from) the national target (the assigned amount). For simplicity, they are treated here as part of the uncovered sector emissions, consistent with the approach described in the Carbon Pollution Reduction Scheme White Paper (Commonwealth of Australia, 2008) 10-17, and the Explanatory Memorandum, Clean Energy Bill 2011 (Cth), 112.

represent their abatement face value and, because of this, uncovered emissions are unchanged from Box A. Due to the presence of the invalid credits, the carbon pollution cap must be reduced to make room for the uncovered emissions and the ACCUs. The reduction in revenue from the carbon pricing scheme in this case equals the number of invalid ACCUs multiplied by the prevailing carbon price. A secondary impact of a reduction in the carbon pollution cap is that it is likely to increase reliance on imported carbon units by liability entities under the CE Act — rather than buying domestic carbon units they would acquire foreign ones. This would have flow-on effects for the remainder of the economy because of the increase in capital movements out of the country. It should also be emphasised that the reverse also applies: if the CFI achieves abatement that contributes to the national emissions target that is not credited by the issuance of Kyoto ACCUs, the primary beneficiary is the Australian Government as it will receive additional revenues from the carbon pricing scheme.[67]

Figure 2 Hypothetical impact of valid and invalid Kyoto ACCUs*



* The numbers included in this figure are purely hypothetical and do not represent a projection of possible valid or invalid ACCUs, or of covered and uncovered emissions.

During the fixed charge period (1 July 2012 to 30 June 2015), every Kyoto ACCU that is bought and surrendered by a liable entity under the carbon pricing scheme is one less carbon unit that can be sold by the Clean Energy Regulator. Irrespective of whether the ACCUs represent their abatement face value, they pose a threat to the revenues from the scheme. In recognition of this, and to ensure that it has sufficient revenue to pay for the tax, pension and family tax reforms that accompany the

[67] Readers should note that in all scenarios in Figure 4, total national emissions remain unchanged, reflecting the fact that invalid Kyoto ACCUs do not affect the environmental outcome — this is determined by the national emissions target.

introduction of the carbon pricing scheme, the Government has capped the use of Kyoto ACCUs during the fixed price period at 5% of an entity's annual liability.[68] If the Kyoto ACCUs that are used do not represent their abatement face value, it will lead to a relative increase in Australia's emissions over this period. To compensate for this, and ensure Australia's net emissions remain within its cumulative limit for the accounting period, the carbon pollution cap will have to be reduced in the flexible charge years, leading to reduced revenues and an increase in carbon unit imports. Alternatively, the government could leave the carbon pollution cap untouched and acquire the foreign units itself or, if there are surplus units at the end of the next accounting period, use these to make up for the invalid ACCUs. In either case, the government suffers either through having to pay directly for foreign units or through lost scheme revenues in future accounting periods.

Due to the revenue implications of invalid ACCUs, there is an inbuilt incentive for the Australian Government to minimise integrity risks, at least in relation to Kyoto ACCUs. To give effect to this, the scheme includes several mechanisms designed specifically to deal with additionality, permanence, leakage and measurement issues.

Additionality

The primary mechanism included to deal with the risk that ACCUs could be issued for non-additional activities is the 'additionality test'.[69] This test applies at two points in the ACCU process: at the approval of methodologies and at the determination of eligibility of offsets projects. As discussed, a condition precedent to the endorsement of a methodology and making of a methodology determination is that the determination complies with the offsets integrity standards, one of which is that the project 'should be covered by the additionality test regulations'.[70] Similarly, in order to declare a project to be an eligible offsets project, the Clean Energy Regulator must be satisfied that the project passes the additionality test.[71]

The exposure draft of the CFI Act included a project-level 'financial additionality' test. A project would only be considered additional if either: (a) there were reasonable grounds to believe the project would not have been financially viable without revenue derived from carbon credits; or (b) there were reasonable grounds to believe that the project would not have been carried out without revenue derived from carbon credits.[72]

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[68] *Clean Energy Act 2011* (Cth), s 125(7).

[69] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 41. Other mechanisms include the requirements in the offsets integrity standards that estimates, projections and assumptions in the methodologies should be conservative and that, in relation to sequestration offsets projects, the methods should provide for adjustments to take account of inter-annual variation. *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 133(1)(f)-(g).

[70] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 133. The use of 'should' in the offsets integrity standards rather than 'must' or 'shall' raises questions about whether strict adherence is required for a determination to comply with the standards. Given the context, and the purpose of the standards, there is a good argument that it is. However, the choice of words has created uncertainty about this issue. *Ward v Williams* (1955) 92 CLR 496; *Finance Facilities Pty Ltd v FCT* (1971) 127 CLR 106; Dennis Pearce and Robert Geddes, *Statutory Interpretation in Australia* (7th ed, 2011) 346–358.

[71] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 27(4)(d).

[72] Australian Government, *Carbon Credits (Carbon Farming Initiative) Bill 2011 – Exposure Draft 22/12/2010* (2010) 57.

During the consultation process, concerns were raised that the financial additionality test would involve excessive transaction costs and could inhibit the supply of ACCUs.[73] This is an issue that has plagued all climate offset schemes: how to strike an appropriate balance between the desire for environmentally credible offsets and the need to minimise transaction costs.[74] An overly stringent additionality test can also lead to the exclusion of low-cost abatement opportunities (sometimes referred to as 'Grubb's paradox').[75] The Australian Government's response to these concerns was to eliminate the project-level additionality test and replace it with a 'project-type' test that is primarily administered through regulations. Under the final version of the legislation, a project passes the additionality test if it satisfies two requirements:

- it must be a project type specified in the regulations (the 'positive list'); and
- it must not be required under a law of the Commonwealth, or a State or Territory.[76]

The 'positive list' is intended to include only activities that are 'not common practice within an industry or region'.[77] In theory, if such a project is proposed, the fact that it is not already 'common practice' should indicate that the project would not normally have occurred, and can thus be considered additional. At present, the positive list consists of 14 broad project types (Table 5). The Government has indicated that the list will be adjusted overtime with input from the DOIC to account for the evolution and adoption of new management practices and technologies.[78]

[73] Explanatory Memorandum, above n 3, 9.
[74] Taishi Sugiyama and Axel Michaelowa, 'Reconciling the design of CDM with inborn paradox of additionality concept' (2001) 1(1) *Climate Policy* 75; Grubb, Vrolijk and Brack, above n 16.
[75] Axel Michaelowa, 'Determination of baselines and additionality for the CDM: A crucial element of credibility of the climate regime' in Farhana Yamin (ed), *Climate Change and Carbon Markets: A Handbook of Emission Reduction Mechanisms* (2005) 289; Grubb, Vrolijk and Brack, above n 16; Sugiyama and Michaelowa, above n 74.
[76] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 41.
[77] Explanatory Memorandum, above n 3, 9; *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 41(3).
[78] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), ss 41(2)-(3). DCCEE, *Carbon Farming Initiative: Positive List guidelines – common practice* (2011).

Table 5 The positive list, as at February 2012

1.	Establishment of permanent plantings on or after 1 July 2007.	8.	Reduction of emissions from ruminants by manipulation of their digestive processes.
2.	Human-induced regeneration, on or after 1 July 2007, of native vegetation, on land that is not conservation land, by exclusion of livestock, management of timing and extent of grazing, humane management of feral animals, management of non-native plants, or cessation of destruction or suppression of regrowth.	9.	Application of urease or nitrification inhibitors to, or with, livestock manure or fertiliser.
3.	Restoration, on land that is not conservation land, of natural wetlands that had been drained.	10.	Capture and combustion of CH_4 from waste deposited in a landfill facility before 1 July 2012.
4.	Application of biochar to soil.	11.	Forestry project accredited under the Greenhouse Friendly initiative.
5.	Capture and combustion of CH_4 from livestock manure.	12.	Until 1 July 2012, a waste diversion project accredited under the Greenhouse Friendly initiative.
6.	Early dry season burning of savanna areas greater than 1 km^2.	13.	Permanent plantings accredited under the NSW Greenhouse Gas Reduction Scheme or ACT Greenhouse Gas Abatement Scheme.
7.	Reduction of CH_4 emissions through humane management of feral goats, deer, pigs or camels.	14.	Permanent plantings established before 1 July 2007 for which there is documentary evidence that demonstrates that the primary purpose of the plantings was generation of carbon offsets.

Source: CFI Regulations, reg 3.28.

By and large, the projects included on the initial positive list are such that they are unlikely to be undertaken without the incentive provided by ACCUs. For example, in normal circumstances, farmers are unlikely to capture and burn CH_4 from livestock manure due to the cost. While this is true in relation to most listed project types, it does not apply to all in all cases. Feral-animal control, for example, is relatively common in agricultural areas and there is a government-funded Cooperative Research Centre (CRC) — the Invasive Animals CRC — devoted exclusively to the management, and where possible, eradication of invasive vertebrate animal species. While there is considerable scope to expand and improve the effectiveness of feral-animal control, the breadth of the additionality test means that some non-additional activities will be eligible under the CFI. The same applies to early dry season burning of savanna grasslands and woodlands, an activity that is practiced on a moderate scale by fire authorities and land managers in northern Australia.[79] These projects illustrate the nature of the trade-off associated with the use of the project-type test embodied in the positive list: the price paid to lower transaction costs is allowing some non-additional projects to generate credits.

[79] DCCEE, above n 21; Northern Territory Government, *Northern Territory Climate Change Policy 2009* (2009).

The second limb of the additionality test — that the project not be required under a law of the Commonwealth, or a State or Territory — is intended to stop proponents from claiming ACCUs for what they are already required to do. Although based on a sensible principle, the provision has its weaknesses. The most obvious is that projects can be exempt from its application by regulation.[80] This is intended to provide the Government with the flexibility to deal with circumstances where it may be necessary to impose a legal requirement that the project be undertaken prior to its declaration as an eligible offset project. An example is the creation of a forestry reserve by a state forestry agency; the Australian Government may wish to see the reserve created under state law before initiating the CFI process. While this regulation-making power could be used to aid the operation of the scheme, it could also be misused. Its very existence could insight industry groups to seek regulatory changes to enable projects to satisfy the additionality test.

The other major weakness in the second limb of the additionality test is its narrow drafting. It only excludes projects required under a law of the Commonwealth, or a state or territory, and does not block projects required under contract or other private law. An example of the problems that stem from this is the treatment of projects that have received funding under other government programs. For example, under the current positive list, government-funded tree planting projects will pass the additionality test if they were established on or after 1 July 2007. Between July 2007 and the end of 2010, at least 19,817 hectares of environmental plantings were established in Australia, suggesting that the supply of ACCUs from this source could be, if not substantial, at least of note.[81] In relation to these types of projects, the CFI consultation paper released in 2010 stated:

> Landscape conservation or restoration that has been funded under previous or existing government programs and secured, for example with a covenant or contract, could not be considered additional … .[82]

While this may have been the initial intent, the current form of the test allows government-funded planting projects to receive ACCUs, even where they have been secured by a covenant or contract.

Some of the gaps left by the two limbs of the additionality test could potentially be addressed through the project eligibility requirements and methodologies. Under s 27(4)(l) of the CFI Act, additional requirements can be imposed on projects via the regulations. Already this power has been used to clarify that biodiversity and vegetation offsets required under other regulatory processes are not eligible under the CFI.[83] Similarly, every methodology will set down specific requirements for relevant eligible offset projects, and the process for determining project baselines and for calculating the net abatement or sequestration number. Through this process, there is the capacity to minimise the risk of ACCUs being issued for non-additional emission reductions or removals. For example, the methodology for 'Permanent Environmental Plantings of Native Species using the CFI Reforestation Modelling Tool' — one of the first three approved methods — includes a requirement that the area converted to

[80] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), ss 41(4A).
[81] DCCEE, *Post-1990 plantations: annual area planted, FullCAM December 2011 (unpublished data)* (2011).
[82] DCCEE, *Design of the Carbon Farming Initiative: Consultation Paper* (2010) 11.
[83] *Carbon Credits (Carbon Farming Initiative) Regulations 2011*, reg 3.5.

forest by plantings would not have otherwise done so. In its words, '[i]f the area would convert to forest without the project, no additional abatement would be generated through reforestation, so no abatement could be claimed'.[84]

Leakage

Leakage is often divided into two types: primary and secondary. Primary leakage refers to leakage caused by project participants, while secondary leakage refers to leakage caused by other people.[85] An example of primary leakage is where the proponent shifts the activity outside of the project boundary.[86] Secondary leakage is usually associated with market effects, for example, where a drop in supply of forest products caused by the project results in price increases that trigger increased harvesting activities in another area.

Under the CFI, the project methodologies are supposed to address primary and secondary leakage risks.[87] In most cases, this is likely to involve the making of a leakage deduction in the calculation of the net abatement or sequestration number. This is apparent from the offsets integrity standards, which include a requirement that methodologies provide for 'a deduction of the carbon dioxide equivalence of the amount that, under the determination, is taken to be the total amount of greenhouse gases that are emitted from any source or sources as a consequence of carrying out the project'.[88] Consistent with this, the Department of Climate Change and Energy Efficiency's *Guidelines for Submitting Methodologies* stress that 'all emissions sources and sinks directly or indirectly affected by the project must be identified and accounted for' and indicate that, where a project may result in leakage, the proposed approach 'may result in a reduction in abatement estimates to take account of leakage risks'.[89]

As with many aspects of the integrity mechanisms, the legislation and regulations give the DOIC and Minister considerable discretion to manage leakage risks. The outcomes will depend on how they exercise this discretion.

Permanence

Offsets are granted to biosequestration projects on the assumption that the sequestered carbon will not be released back into the atmosphere for a prolonged period. If it does, it will undermine the environmental integrity of the credits, or in the case of Kyoto ACCUs, lead to reduced revenues from the carbon pricing scheme.

The CFI has three main mechanisms to deal with these risks. First, under the offsets integrity standards, the methodologies are supposed to be conservative and include

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[84] DCCEE, *Methodology for Quantifying Carbon Sequestration by Permanent Environmental Plantings of Native Species using the CFI Reforestation Modelling Tool* (2011) 6.
[85] Nabuurs, above n 62; Paulsson, above n 61.
[86] Primary leakage is also known as activity-shifting. See Watson et al, above n 61; Paulsson, above n 61.
[87] In the Explanatory Memorandum (above n 3, 54), the Government provides the case where soil carbon is enhanced through greater use of nitrogen fertiliser, leading to increased N_2O emissions, as an example of direct (primary) leakage. This is not leakage, which refers to an increase or decrease in emissions *outside* the project boundary.
[88] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 133(1)(e).
[89] DCCEE, *Carbon Farming Initiative: Guidelines for Submitting Methodologies* (2011) 4, 11.

provisions to account for 'significant cyclical variations'.[90] Second, when calculating the unit entitlement for sequestration projects, a formal 'risk of reversal buffer' must be deducted from the net abatement or sequestration number — generally 5% of the net abatement or sequestration number.[91] Third, under the Act, the general rule is that sequestration projects, and the carbon they sequester, must be maintained for 100 years.[92] This obligation is imposed via the relinquishment requirements in Part 7 of the legislation and the carbon maintenance obligation powers in Part 8. Under Part 7, the project proponent can be required to relinquish ACCUs of the same type as they have received (Kyoto or non-Kyoto) if the project is voluntarily or compulsorily terminated, or there has been a reversal of the removals associated with the project within the 'maximum potential relinquishment period' (100 years or as set by the regulations).[93] If a proponent fails to relinquish ACCUs as required, the Clean Energy Regulator can make a declaration that the project area is subject to a carbon maintenance obligation.[94] A carbon maintenance obligation effectively puts a freeze on the carbon sequestered in the area's carbon pools at the time the declaration is made (called the 'benchmark sequestration level').[95]

At first glance, the requirement to give back ACCUs may not seem like a significant deterrent; if you get caught rorting the scheme all the Regulator will require is that you give back the ACCUs. This ignores the likely trajectory of the carbon price. A considerable amount of the modelling of likely future trends in carbon compliance markets assumes the carbon price will follow something approaching Hotelling's rule, or a roughly four per cent per annum real increase.[96] While there are reasons to doubt this assumption, including a lack of empirical support for Hotelling's rule in non-renewable resource markets, and uncertainty about future domestic and international emissions regimes,[97] it seems likely that the carbon price will rise appreciably over the medium- to long-term.[98] Due to this, the requirement to relinquish ACCUs, particularly Kyoto ACCUs, could prove extremely expensive.

Arguably, the greatest weakness in the permanence mechanisms is the 100-year rule. The use of this timeframe is presumably based on the view that the atmospheric lifetime of CO_2 — the time it takes for an increase in the atmospheric concentration of CO_2 to be reduced to 37% of its initial amount[99] — is around 100 years.[100] If most of

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[90] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 133(1)(f)–(g).
[91] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), ss 16, 17; Explanatory Memorandum, above n 3, 68.
[92] Explanatory Memorandum, above n 3, 63. This period can be modified by regulation; *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 87.
[93] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 87.
[94] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 97.
[95] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 97(8).
[96] Harold Hotelling, 'The Economics of Exhaustible Resources' (1931) 39(2) *Journal of Political Economy* 137; Australian Treasury, *Strong Growth, Low Pollution: Modeling a Carbon Price* (2011); Australian Treasury, *Australia's Low Pollution Future: The Economics of Climate Change Mitigation* (2008); Ross Garnaut, *The Garnaut Climate Change Review* (2008).
[97] John Livernois, 'On the Empirical Significance of the Hotelling Rule' (2009) 3(1) *Review of Environmental Economics and Policy* 22.
[98] E Tvinnereim et al, *Carbon 2011* (2011).
[99] Susan Solomon et al (eds), *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007).
[100] DCCEE, *Design of the Carbon Farming Initiative: Consultation Paper* (2010). For broader literature on relevance of 100 year period, see T J Blasing, *Recent Greenhouse Gas Concentrations*

the CO_2 is re-sequestered, on a net basis, after 100 years, any release from carbon stores after this time is of no consequence, or so the argument goes.

The origins of the notion that the lifetime of CO_2 is around 100 years can be traced to the Intergovernmental Panel on Climate Change's assessment reports. In the first assessment report, in 1990, the lifetime of CO_2 was given as 50 to 200 years.[101] The second and third assessment reports listed the range as 5 to 200 years, the lower end representing the potential atmospheric residence times of individual carbon atoms.[102] The fourth assessment report, published in 2007, did not include an estimate but suggested that '[a]bout half of a CO_2 pulse to the atmosphere is removed over a timescale of 30 years; a further 30% is removed within a few centuries; and the remaining 20% will typically stay in the atmosphere for many thousands of years'.[103]

In truth, CO_2 has no single atmospheric lifetime. The lifetime will differ depending on the initial CO_2 concentration, the size of the emissions pulse, the time over which it is released and the nature and magnitude of carbon cycle feedbacks.[104] Importantly, and contrary to popular belief, the net drawdown of CO_2 from the atmosphere does not follow a simple exponential decay function. As Archer and Brovkin explain:

> … the real carbon uptake follows a sum of exponentials, rather than a single exponential decay. After the fastest exponential decay is finished, there is still CO_2 left in the atmosphere awaiting slower uptake mechanisms.[105]

The implication is that, once the atmospheric concentration of CO_2 has been raised, a substantial proportion of the increase — the estimates in the literature generally range between 20% and 40%, and possibly even up to 60% — will remain for thousands of years.[106] Due to this, it is arguable that a 100-year permanence requirement is inadequate. The release of sequestered CO_2 after 100 years will negate the initial benefits of the offset project.

(2012) Carbon Dioxide Information Analysis Centre <http://cdiac.ornl.gov/pns/current_ghg.html> at 27 February 2012; and Mark Jacobson, 'Correction to "Control of fossil-fuel particulate black carbon and organic matter, possibly the most effective method of slowing global warming"' (2005) 110 *Journal of Geophysical Research* D14105.

[101] John Houghton, Gregory Jenkins and J J Ephraums (eds), *Climate Change: The IPCC Scientific Assessment* (1990).

[102] John Houghton et al (eds), *Climate Change 1995: The Science of Climate Change. Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change* (1996); John Houghton et al (eds), *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change* (2001).

[103] Kenneth Denman et al, 'Couplings Between Changes in the Climate System and Biogeochemistry' in Susan Solomon et al (eds), *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007) 501.

[104] David Archer et al, 'Atmospheric Lifetime of Fossil Fuel Carbon Dioxide' (2009) 37 *Annual Review of Earth and Planetary Sciences* 117; David Archer and Victor Brovkin, 'The millennial atmospheric lifetime of anthropogenic CO2' (2008) 90 *Climatic Change* 283; Piers Forster et al, 'Changes in Atmospheric Constituents and in Radiative Forcing' in Susan Solomon et al (eds), *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007) 129.

[105] Archer and Brovkin, above n 104, 293.

[106] Archer et al, above n 104; Archer and Brovkin, above n 104.

In defence of the use of 100 years, it is arguable that not all of the sequestered carbon will be released. Provided that at least 20%-40% of the carbon stores remain intact, there is unlikely to be a significant loss. Further, in relation to Kyoto offset projects, if there is still a cap on national emissions in 100 years, the impacts will be financial rather than environmental. When possible financial losses after 100 years are discounted, they will be irrelevant. From a more practical perspective, the use of a longer timeframe would be unpalatable for many landholders and potentially stifle the supply of ACCUs. Landholders have consistently expressed concern about the implications of 'locking up' land for 100 years under the CFI.[107] The use of a longer period would have exacerbated these concerns.

Measurement

As discussed, measurement (or more often estimation) of emissions and removals from LULUCF, waste and agriculture is subject to considerable uncertainty, giving rise to the risk of inadvertent errors and false crediting. The complexity of emission and removal measurement also exposes the scheme to fraud. The CFI Act contains three main mechanisms to deal with these issues. The first is the offsets integrity standards. They require that methodologies 'should not be inconsistent with the methods set out in the National Inventory Report'.[108] The National Inventory Report is the annual submission made by the Australian Government under the UNFCCC.[109] Ensuring consistency between the CFI and National Inventory Report methods will not necessarily protect against all measurement errors — there are uncertainties associated with the National Inventory Report methods[110] — but it should ensure the CFI methods are of a reasonable standard and reduce the risk of Kyoto ACCUs being issued that expose the Australian Government to a potential financial liability or revenue losses.

In addition to this requirement, the offsets integrity standards also provide that the estimates of removals, reductions and emissions under the methodologies should be measurable and capable of verification,[111] and that any estimate, projection or assumption be conservative.[112] The standards contain a further requirement that the

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[107] National Farmers Federation, *Design of the Carbon Farming Initiative: NFF Submission* (2011) 8; National Farmers Federation, *Submission to the Senate Standing Committees on Environment and Communications into Carbon Credits (Carbon Farming Initiative) Bill 2011; Carbon Credits (Consequential Amendments) Bill 2011 and Australian National Registry of Emissions Units Bill 2011* (2011); National Farmers Federation, 'Farmers welcome movement on Carbon Farming Initiative' (Press Release, 24 March 2011); NSW Farmers Association, *Submission to the Department of Climate Change and Energy Efficiency: Design of the Carbon Farming Initiative Consultation Paper* (2011); Carbon Farmers of Australia and Carbon Farming and Trading Association, *Submission to the Senate Environment and Communications Legislation Committee Inquiry into the Carbon Credits* (Carbon Farming Initiative) Bill 2011 (2011); AgForce, *Design of the Carbon Farming Initiative Consultation Paper: AgForce Submission* (2011); Australian Broadcasting Corporation, 'Farmers getting heads around new carbon credits scheme', *AM*, 13 February 2012 <http://www.abc.net.au/am/content/2012/s3428892.htm> at 27 February 2012.

[108] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 133(1)(c).

[109] The National Inventory Reports from 2003 onwards are available at: UNFCCC Secretariat, *GHG National Inventory Submissions* (2012) <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/6598.php> at 17 February 2012.

[110] DCCEE, above n 21.

[111] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 133(1)(b).

[112] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 133(1)(g).

methodologies 'should be supported by relevant scientific results published in peer-reviewed literature'.[113]

The second mechanism designed to deal with measurement issues is that prior to crediting, and in some cases prior to project approval, a prescribed audit report prepared by a 'registered greenhouse and energy auditor' can be required in order to verify abatement calculations.[114] While this has the potential to reduce inadvertent and deliberate errors, the legislation allows regulations to be made that exempt projects from both the reporting and auditing requirements.

The final mechanism is the enforcement powers. The Clean Energy Regulator can unilaterally terminate a project if the eligibility requirements are not satisfied or the proponent provides false or misleading information in relation to the project.[115] Where this occurs, the Regulator can require the proponent to relinquish ACCUs under Part 7. In addition, proponents can be prosecuted for fraudulent conduct under the *Criminal Code* and, under s 171 of the CFI Act, a Court can order that ACCUs be relinquished if they were issued as a result of the fraud.

Of the three mechanisms, the administration of the offsets integrity standards is likely to be the most important. The rigour with which the DOIC implements these standards, and the measurement, accounting and other related project requirements that it imposes through the methodologies, will largely dictate how great an issue measurement risks are for the scheme.

DEALING WITH PERVERSE IMPACT RISKS AND CO-BENEFITS

In addition to the mitigation functions they fulfil, offsets also have the potential to generate important co-benefits. LULUCF and agricultural offset projects in particular can lead to improved biodiversity, soil, hydrological and cultural heritage outcomes.[116] They can also generate local employment benefits and increase human and social capital.[117] Although offsets can generate co-benefits, the secondary impacts are not always positive.[118] Poorly designed forestry offset projects, for example, can lead to deforestation, increased fertiliser use, altered fire regimes, increased pressure on water resources and species switching, all of which can have adverse biodiversity,

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[113] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 133(1)(d).

[114] The framework for auditors is contained in the *National Greenhouse and Energy Reporting Act 2007* (Cth). Auditing activities under the CFI Act must be undertaken by a 'registered greenhouse and energy auditor' (see, for example, *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 23(1)(d)). 'Registered greenhouse and energy auditor' is defined in s 5 according to the definition in the *National Greenhouse and Energy Reporting Act 2007* (Cth).

[115] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), ss 34–38.

[116] Michael Huston and Gregg Marland, 'Carbon Management and Biodiversity' (2003) 67 *Journal of Environmental Management* 77; Andrew Plantinga and JunJie Wu, 'Co-benefits from Carbon Sequestration in Forests: Evaluating Reductions in Agricultural Externalities from an Afforestation Policy in Wisconsin' (2003) 79(1) *Land Economics* 74; United States Environmental Protection Agency, *Greenhouse Mitigation Potential in U.S. Forestry and Agriculture* (2005); Nobuo Imai et al, 'Co-Benefits of Sustainable Forest Management in Biodiversity Conservation and Carbon Sequestration' (2009) 4(12) *Public Library of Science (PLoS) One* e8267; Watson et al, above n 61.

[117] Daniel Klooster and Omar Masera, 'Community forest management in Mexico: carbon mitigation and biodiversity conservation through rural development' (2000) 10 *Global Environmental Change* 259; Watson et al, above n 61.

[118] Fry, above n 62; Paulsson, above n 61.

natural resource and heritage impacts.[119] In addition, as the debate over plantations in Australian agricultural areas has illustrated, they can adversely affect communities and potentially lead to income losses in some groups.[120] Ideally, all offset schemes should have mechanisms to minimise perverse impact risks and promote the capture of co-benefits.

Management of perverse impact risks

During the consultation process over the legislation, a number of groups and individuals, particularly those representing agricultural and environmental interests, expressed concern about the potential for reforestation projects to increase pressure on already stressed ground and surface water resources.[121] They were also anxious about the spread of plantations and the potential associated negative impacts on local economies, wildfire risk, landscape values and biodiversity.[122] In order to address these perverse impact risks, the Government devised the concept of a 'negative list'. Under s 56 of the CFI Act, regulations can be made to designate certain project types as 'excluded offsets projects'. This purpose of this 'negative list' is to exclude projects that could have significant adverse impacts on water availability, biodiversity conservation, employment, local communities, and land access for agricultural production, or that could otherwise undermine the efficient operation of the scheme. The current negative list consists of seven project types, including the planting of weed species, the establishment of a forestry managed investment scheme, avoiding harvest of a plantation, revegetation of illegally cleared land, revegetation of land subject to native-forest clearing within 7 years of the application, and the planting of trees in an area whose average rainfall exceeds 600 mm unless it meets specified requirements.[123]

The initial list covers the main perverse impact risks raised in the consultation process and will prevent the crediting of projects that pose the most obvious risks, including monoculture plantations and reforestation projects in areas with over-allocated ground- and surface-water resources. However, by using a regulation-based approach, considerable discretion is left in the hands of the government of the day. As a result,

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[119] German Advisory Council on Global Change (WBGU), *The Accounting of Biological Sinks and Sources Under the Kyoto Protocol-A Step Forwards or Backwards for Global Environmental Protection?* (1998); Alejandro Caparrós and Frederic Jacquemont, 'Conflicts between biodiversity and carbon sequestration programs: economic and legal implications' (2003) 46 *Ecological Economics* 143; Huston and Marland, above n 116; United States Environmental Protection Agency, above n 116; Australian State of the Environment Committee, *State of the Environment 2011* (2011).

[120] Louise Fortmann, 'Great planting disasters: pitfalls in technical assistance in forestry' (1988) 5(1-2) *Agriculture and Human Values* 49; Jacqueline Schirmer, *Socioeconomic impacts of the plantation industry on rural communities in Tasmania* (2009); Jacqueline Schirmer, *Socioeconomic impacts of the plantation industry on rural communities in Western Australia* (2009); Australian State of the Environment Committee, above n 119.

[121] National Farmers Federation, *Design of the Carbon Farming Initiative: NFF Submission* (2011); Australian Landcare Council, *Design of the Carbon Farming Initiative* (2011); Pew Environment Group-Australia, *Submission on the Design of the Carbon Farming Initiative* (2011); WWF Australia, *WWF Submission to the Carbon Farming Initiative* (2011); Victorian Government, *The Carbon Farming Initiative Consultation Paper: Victorian Government Submission* (2011); Australian Conservation Foundation, *Submission from the Australian Conservation Foundation to the Design of the Carbon Farming Initiative consultation paper* (2011); AgForce, above n 107; NSW Farmers Federation, above n 107.

[122] Ibid.

[123] *Carbon Credits (Carbon Farming Initiative) Regulations 2011*, regs 3.36 and 3.37.

there is no guarantee of what, when or how projects will be listed or de-listed. This leaves the process open to politicisation and ad hoc decision making. There is also no guarantee that members of the public, including potential project proponents, will be consulted on what is included on the negative list. A more structured listing and governance process may have been preferable.

While the negative list is intended to be the primary mechanism for dealing with perverse impacts risks, there are several other support provisions. Projects are required to have all necessary Commonwealth, State and Territory regulatory approvals concerning land use and development, water and the environment and, if they do not, the eligible offsets project declaration must include a condition requiring them to be obtained prior to the end of the project's first crediting period.[124] Similarly, the Clean Energy Regulator cannot declare a project to be an eligible offsets project if it involves clearing a native forest or using material obtained from clearing or harvesting a native forest.[125] Project proponents are also required to indicate whether their projects are consistent with any applicable regional natural resource management (NRM) plan when applying for an eligible offsets project declaration and must notify the Regulator if their project becomes inconsistent with such a plan.[126] In addition, the Register of Offset Projects, which the Regulator is required to maintain, must note whether a project is consistent with any applicable regional NRM plan.[127]

For the most part, these additional provisions are unlikely to have a major impact on the operation of the scheme. The requirement to obtain regulatory approvals merely duplicates an existing legal obligation. The native forest restrictions should be of limited import because of the permanence requirements, particularly the 100-year rule, and the negative list. The quality and rigour of regional NRM plans varies across the country and the Government has made it clear that it does not intend to block projects that are inconsistent with them. All the applicable provisions are intended to do is ensure proponents consider the plans when devising projects and allow for ACCUs to be marketed on the basis of being consistent with them.

Capturing co-benefits

In order to promote projects that are likely to generate co-benefits, the CFI Act allows for these attributes to be noted on the Register of Offset Projects. The Register must include details of all eligible offset projects and, at the request of the proponent, it can also include information on their environmental or community benefits, provided the requested information meets requirements prescribed in the regulations.[128]

At the time of writing, the regulations governing this co-benefit mechanism had not been made. However, the Explanatory Memorandum states:

> It is intended that the regulations will specify an environmental and social co-benefits index, to provide a credible, low cost way for proponents to rate,

[124] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 28.
[125] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 27(4)(j).
[126] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), ss 22, 83.
[127] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 168(1)(i).
[128] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s168(1)(o).

market and obtain a premium for co-benefits, for example, protecting biodiversity.[129]

The idea behind this Registration process appears to have been borrowed from certification schemes like the 'Gold Standard' — developed by the World Wide Fund for Nature (WWF), SouthSouthNorth and Helio International — which has been used to market premium Certified Emission Reductions (CERs) and ERUs generated by the Kyoto Protocol's Clean Development Mechanism (CDM) and Joint Implementation (JI) scheme.[130] The verification criteria for Gold Standard projects require the proponent to demonstrate that the project satisfies 'safeguarding principles', which are designed to minimise the risk of negative impacts, and 'demonstrate clear benefits to sustainable development'.[131] As Boyd and Salzman have suggested, the most compelling explanations for the emergence of the Gold Standard and like schemes relate to environmental integrity and co-benefits concerns.[132] There have been problems with the CDM and JI, mostly in relation to additionality and the promotion of sustainable development.[133] The premium certification schemes have allowed buyers to insure themselves against these issues and associated political risks.

Although the Gold Standard has performed a valuable function, its market presence has been limited. At 17 February 2012, 1.1 million Gold Standard CERs had been issued.[134] In contrast, the total number of CERs issued to the same date was almost 866 million.[135] While participants in Kyoto compliance markets may not have always sought out the cheapest ways of fulfilling their obligations, it appears they have largely been unwilling to pay the price associated with premium co-benefit certified credits. The same patterns are likely to occur with the CFI. In the voluntary market, high co-benefit credits could have a significant presence because demand for non-Kyoto ACCUs is likely to come from two main sources: corporations seeking branding benefits, where premium credits will allow the buyer to differentiate themselves from others, and the CFI non-Kyoto Carbon Fund. The scope for premium Kyoto ACCUs in compliance markets is likely to be more limited.

CONCLUSION

The CFI Act is a significant addition to the Australian climate law landscape and represents one of the broadest and most comprehensive domestic offset schemes of its type in the world. There is a coherent logic to the structure of the scheme and its linkages with other policy mechanisms, particularly the carbon pricing scheme and the equivalent carbon pricing arrangements. If administrated effectively, it has the capacity to significantly reduce the cost of meeting Australia's mitigation targets and promote more sustainable land-management practices.

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[129] Explanatory Memorandum, above n 3, 127.
[130] Kyoto Protocol, open for signature 16 March 1998, 37 ILM 22, arts 6, 12 (entered into force 16 February 2005).
[131] Ecofys, TUV-SUD and FIELD, *The Gold Standard: Requirements* (2009) 40.
[132] William Boyd and James Salzman, 'The Curious Case of Greening in Carbon Markets' (2011) 41 *Environmental Law* 73, 90.
[133] Paulsson, above n 61.
[134] The Gold Standard Foundation, *Gold Standard Registry* <https://gs1.apx.com/mymodule/mypage.asp> at 17 February 2012.
[135] UNFCCC Secretariat, *Issuance Certified Emission Reductions (CERs)*, <http://cdm.unfccc.int/Issuance/cers_iss.html> at 20 February 2012.

Two major issues could stifle the realisation of the CFI's potential. Its voluntary nature means the scheme could be under-utilised. Lack of information, awareness and understanding amongst landholders, uncertainty about the operation of the scheme, cultural barriers, low carbon prices and wariness about the prospects of domestic and international carbon markets could all act to stifle the initiation of projects and supply of ACCUs. The failure of the scheme to thrive would be a loss to regional areas and the environment, and potentially significantly increase the cost of meeting Australia's mitigation targets. Without on-going government support, the non-Kyoto elements of the scheme are at greatest risk of underperformance because of low carbon prices in voluntary markets. Although the risk is not as great, the supply of Kyoto ACCUs, at least in the early years of the scheme, could also be underwhelming.

The CFI Act gives the Government, Clean Energy Regulator and the DOIC broad administrative powers that are vital to the operation of the scheme. How these powers are wielded will be a major factor in its success or failure. Collectively, they will determine how effectively the integrity and perverse impact risks are managed, and what balance is struck between ensuring the measures that are put in place to deal with these issues are not so onerous to choke off the supply of ACCUs but not so lax as to undermine the scheme's objectives. The dissemination of information on the scheme will also be crucial to allying concerns of landholders and overcoming a number of the barriers to the uptake of projects. Time will tell how well these functions are performed.

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