

Carbon credits from forestry: questions and answers for rural landholders

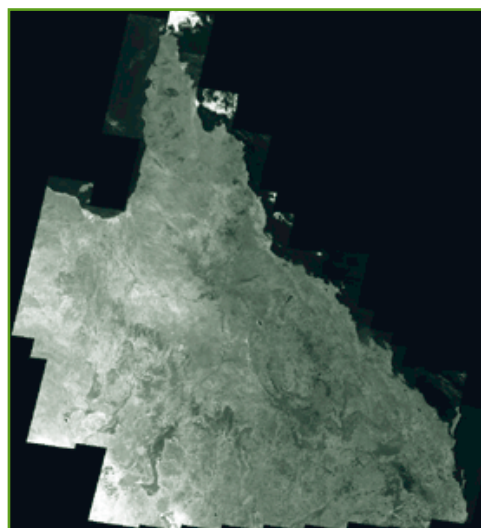


Queensland
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Definitions

Carbon credit: an amount of carbon stored or sequestered in a carbon sink, which can be used by governments, or other entities, to offset greenhouse gas emissions.

Source: any process or activity that releases a greenhouse gas, an aerosol, or a precursor of a greenhouse gas into the atmosphere.

Sink: a pool or reservoir that stores carbon, hence lowering the amount of carbon dioxide in the atmosphere.

Sequestration: the removal of greenhouse gases from the atmosphere by plants or technological measures. Carbon sequestration is defined by the Intergovernmental Panel on Climate Change (IPCC) as the process through which carbon is absorbed by biomass such as trees, soils or crops.

Kyoto Protocol: an international agreement, reached in 1997 in Kyoto, Japan, which extends the commitments of the United Nations Framework Convention on Climate Change. In particular, it sets targets for future emissions for developed countries.

Kyoto forest; Kyoto lands: areas covered by Article 3.3¹ activities, as well as any additional activities agreed under Article 3.4².

Greenhouse gases: those gaseous constituents, both natural and anthropogenic, which absorb and re-emit infra-red radiation. They include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆).

Joint implementation (JI): article 6 of the Kyoto Protocol permits JI, whereby developed countries are able to invest in projects in other developed countries to acquire credits to assist in meeting their assigned targets. Countries are only able to use credits generated in the commitment period 2008 to 2012. Participation is voluntary, and open to private and public entities alike if approved by the Party to the Protocol (i.e. the country involved).

Clean development mechanism (CDM): article 12 of the Kyoto Protocol provides for the CDM, whereby developed countries are able to invest in emissions-reducing projects in developing countries to obtain credits to assist in meeting their assigned target. Details of the CDM have yet to be negotiated at the international level. However, it does allow countries to use credits obtained from the year 2000 for the purposes of meeting their assigned amounts. Participation is voluntary, and open to private and public entities alike if approved by the Party to the Protocol (i.e. the country involved).

Source: Greenhouse sinks and the Kyoto Protocol: an issues paper, 2000, the Australian Greenhouse Office, Canberra.

Footnotes:

- 1 Article 3.3 deals with changes in greenhouse gas emissions due to direct, human-induced land-use change and forestry activities such as afforestation, reforestation and deforestation since 1990.
- 2 Article 3.4 deals with establishing a process for potentially including emissions from additional agricultural soil and land-use change and forestry activities.

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1 Introduction

Greenhouse has become a high profile issue in Australia since the signing of the Kyoto Protocol, and governments, businesses and individuals are directing much attention to how Australia will respond to the challenges presented. The role that carbon credits may play is a particular focus of attention.

The Kyoto Protocol identifies greenhouse gas emission targets for developed countries. These include both sources and sinks of these gases. The inclusion of sinks in the protocol creates the opportunity to establish them for the specific purpose of offsetting greenhouse gas emissions elsewhere. These offsets, or credits, form the basis of a carbon credit. Investors, from both Australia and overseas, see the potential benefits from establishing greenhouse sinks and are exploring opportunities to invest in their creation.

Carbon credits may be associated with the following issues of interest to rural landholders and producers, and forest growers in Queensland:

- a new source of income
- a new source of funding environmental restoration works, and agricultural soil and land management activities
- improved agricultural and land management practices
- environmental benefits, such as reduced land degradation, reduced salinity, and enhancement of biodiversity.

However, it is important to understand that the potential benefits of carbon credits are speculative and involve both costs and significant risk.

This paper aims to provide some simple answers to what carbon credits are, how rural landholders and producers can be involved, and what factors they should consider in investigating opportunities to develop carbon sinks through forestry activities.



2 Background to carbon credits

What is the Kyoto Protocol?

The 1997 Kyoto Protocol is the international treaty agreed to in principle (but yet to be ratified) by parties to the Framework Convention on Climate Change to limit greenhouse gas emissions. The protocol assigns each developed country a greenhouse gas target—Australia has a target of 108 per cent of 1990 emissions, to be achieved, on average, during the period 2008–2012 (the first commitment period).

While the reduction of emissions, or abatement, will be the primary action to meet Kyoto targets, the protocol allows the use of other methods to assist countries in meeting their targets. These include emissions trading, joint implementation (JI) and the clean development mechanism (CDM). An emissions trading system, if introduced, would be based on a permit authorising the holder to emit a specified amount of greenhouse gas (thus placing a limit on current emissions). Carbon sinks, such as forestry plantations, could be incorporated into this system by allocating credits for the amount of carbon sequestered (stored in plants), which could then be sold to emitters, allowing them to offset rather than reduce total emissions.

This paper focuses on **carbon credits**, as they could be earned through activities undertaken in rural areas. They offer a potential solution for companies to offset emissions and could be used in any future emissions trading scheme. The development of forestry carbon sinks will also help Australia, as a whole, to meet its Kyoto commitments.

What is a carbon sink and what is carbon sequestration?

Carbon sinks result from activities that remove carbon dioxide from the atmosphere and lock away carbon. This process, known as carbon sequestration, is important for mitigating the negative impacts of climate change. Only internationally approved carbon sinks will be eligible to generate credits used for Kyoto purposes.

What is a carbon credit?

A carbon credit refers to an amount of carbon that has been stored or sequestered in a carbon sink and which can then be used by governments or other entities to offset greenhouse gas emissions.

Other forms of credits might be gained through emissions reductions, JI or CDM, but these are not discussed in detail in this paper. However, it is likely that the different forms of credits will have the same unit value and be fully interchangeable with each other. Information on carbon credits and emissions trading is available at the following websites:

<http://www.greenhouse.gov.au/emissionstrading>

<http://www.carbontrading.com.au>

Which carbon sink activities might earn credits?

Forestry, and a range of other activities including revegetation activities, land use and agricultural soil management practices, forest management practices, and forest conservation are the main carbon sink activities that could generate carbon sinks. At international conferences to provide the detailed rules for implementing the Kyoto Protocol, Australia will negotiate for these sinks to be made eligible for earning carbon credits. Final resolution of which activities will create carbon credits that can be sold in a trading scheme developed under the Kyoto Protocol is unlikely to occur for some time.

- Forestry—this is likely to be a major source of carbon credits as a large amount of carbon is sequestered and stored during tree growth over long periods. Only ‘Kyoto forests’—forests planted since 1990, on previously cleared land—will be eligible for the generation of carbon credits. There is most interest in carbon sequestration by trees during the 2008–2012 commitment period under the Kyoto Protocol. As the establishment of any trading scheme is unclear at this stage, the question of whether carbon credits will be able to be traded in such a scheme for the 2008–2012 period and beyond is very uncertain.
- Additional activities—a range of activities in addition to Kyoto forestry may also be eligible to earn carbon credits. To qualify, an activity must

provide a carbon sink that is human-induced, verifiable, and related to agricultural soils, land-use change, or forestry. Examples of additional activities may include:

- 1) revegetation activities, for example farm forestry and environmental plantings (under Natural Heritage Trust, landcare, bushcare, etc.) involving shrubs and other non-woody vegetation which, because they do not meet minimum height, canopy cover or area requirements, do not satisfy the requirements for Kyoto forests
- 2) land use and agricultural soil management practices, such as minimum till cropping, crop rotation, stock management and reduced harvesting
- 3) forest management practices, such as forest regeneration and fertilisation, pest and forest fire management, and harvest practices, quantity and timing
- 4) forest conservation, such as national parks designated since 1990, or forest production areas that have been conserved by Regional Forest Agreements.

The additional activities described above have yet to obtain international acceptance. The Australian Greenhouse Office has published a paper, *Greenhouse sinks and the Kyoto Protocol: an issues paper*, which discusses potential Kyoto sinks in further detail.

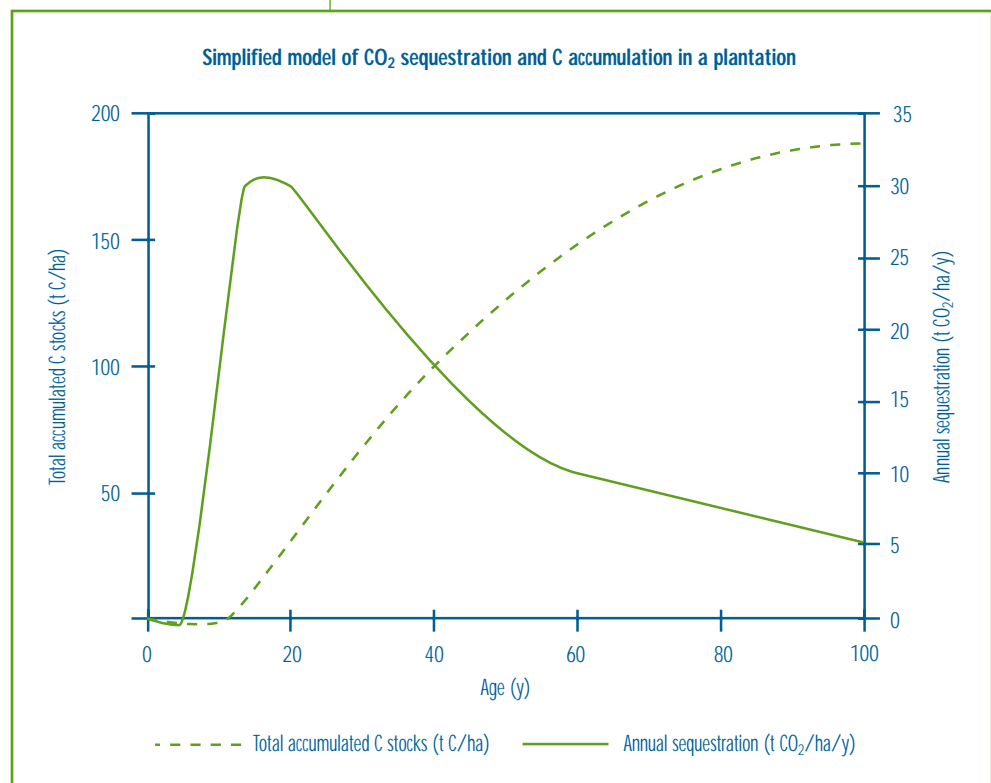


Figure 1. Carbon sequestration during the commitment period in reforestation and afforestation projects may be credited for international trading subject to rules and definitions yet to be agreed for Articles 3.3 and 17 of the Kyoto Protocol. In this example a plantation established in 2000 would be sequestering approximately 15 t CO₂/ha/y during the first commitment period (2008 to 2012).

Source: Adapted from Greenhouse Challenge Sinks Workbook 1998 and West and Matthey (1993)

3 How carbon credit trading markets might operate

What is emissions trading?

Emissions trading and carbon credit trading are two different, but closely linked mechanisms. If the Australian Government adopts emissions trading, businesses producing greenhouse gases could be required to hold emissions permits equivalent to their level of emissions. Any excess permits held by a firm (e.g. created when the actual emissions of a business are less than the total allowed by the permits) might be tradeable on an open market.

Carbon sinks could be included in emissions trading by allocating credits for the amount of carbon sequestered by a sink. The credits could be fully interchangeable with permits (i.e. they would represent an offset to an emission), and could also be traded through the emissions trading market.

Carbon credit trading could also be voluntary, and operate prior to emissions trading, through non-government systems. However, credits traded in any early markets would need to satisfy government standards before they could be used for Kyoto purposes. As yet, no such standards exist.

What types of trading will occur?

There is no government approved framework at present which recognises carbon credit trading. A formal tradeable permit market established under the Kyoto Protocol will not commence until international rules and systems are developed, and this could be several years away.

However, prior to the establishment of an emissions trading regime, there has been some limited preliminary trading in rights to carbon sequestration. This is speculative investment, based on the presumption that these rights will have a higher value in the future if a trading scheme is established. The simplest form of trade has been where two parties seek each other out and enter into direct agreements, such as those between State Forests of New South Wales and electricity generating companies (see below). 'Over the counter' trades have also commenced in the United States, where buyers and sellers are brought together via agencies such as brokers and dealers.

Who will purchase carbon credits?

Providing that an emissions trading system is established, businesses from around the world looking to offset greenhouse gas emissions will be the main purchaser of carbon credits. Carbon sequestration provides a potentially attractive opportunity to minimise greenhouse risks, as credits earned may offer a lower cost option than alternatives such as reducing production, introducing new technology, or purchasing permits through emissions trading.

Some early trades are occurring in anticipation that carbon credits will be Kyoto compliant and will provide businesses with a competitive advantage. Examples include recent investments by electricity generators from New South Wales (Delta Electricity and Pacific Power) and Japan (Tokyo Electric Power Company—TEPCO), who may gain carbon credits from plantations established by State Forests of New South Wales.

Speculators in the market, including investment banks, could also purchase credits through any centralised markets.

How might rural landholders and producers participate?

Rural landholders may participate by providing available land for others to plant forests, by planting commercial plantations of their own, or by planting forests for environmental reasons. Of course, the land and forests must be compliant with the Kyoto Protocol in order to generate credits, as discussed earlier.

With increasing investment in Kyoto forests, it is expected that government and private forest growers will be seeking available land for planting, using investment funds from greenhouse gas emitters and investment agencies requiring carbon credits. Rural landholders may be able to gain a flow of income by renting their land to these parties, while leaving the costs and responsibilities of forest establishment and management to the firm establishing the plantation.

Alternatively, they may choose to plant their own Kyoto forests, and gain future income from both the sale of carbon credits, and the returns from the timber produced. Landholders considering this option should be aware of the potential costs and risks, discussed in section 4.

A third option may be to plant vegetation for environmental purposes (e.g. to reduce land degradation or salinity, or to enhance biodiversity) and seek to gain income from the carbon credits thus generated. Unlike forestry, environmental plantings would not require harvesting and would continue to generate carbon

credits for the period in which there is net growth in the plantation. Private companies may be interested in funding (wholly or in part) environmental plantings in exchange for the rights to any carbon credits generated. The Commonwealth's 'Bush for Greenhouse' program aims to increase private investment in this area.

This program has established a carbon broker through a consortium of Ernst & Young, Greening Australia and Landcare Australia. The carbon broker will:

- secure investment
- identify revegetation projects
- channel investment to projects
- provide expertise
- manage the pool of carbon resulting from the growth of trees.

Investors will be able to claim carbon offsets generated by carbon stored in plantings. These carbon offsets will be recognised under the Greenhouse Challenge program.

Rural producers could also be a source of carbon credits if land use and agricultural soil management practices are accepted as eligible carbon sink activities (see section 2). Discussions at the sixth Conference of Parties (COP6) did not resolve this issue, but it is hoped that ongoing international negotiation will lead to resolution in the near future. These decisions are important as they will determine what types of carbon sinks will be able to generate carbon credits under any tradeable permits regime established under the Kyoto Protocol.

What will be the price of a carbon credit?

It is difficult to predict a firm price of the future market value of carbon credits, as open trading has not yet commenced. Prices will be determined by supply and demand, and by the bids offered by participants. Opportunity, risk and time frames will also have an

influence. While estimates have ranged from \$2 to \$60 per tonne of CO₂ equivalent, indicators of value include the agreement between the Pacific Power and State Forests of New South Wales (A\$4), carbon pricing by the Danish Government (US\$6), and the price expected by the New Zealand Government (US\$2.50–\$5.00).

4 What rural producers should consider before investing in carbon credits

Due to the potential interest in carbon credit trading, some rural landholders and producers are considering investing in carbon sink activities, in particular, forestry. A number of important issues outlined below should be evaluated before investment decisions are made.

What is the most viable land use in my region?

Before commencing with any new carbon sequestration activities, rural landholders must consider whether the activity will be more beneficial than the current or alternative land uses. Some activities that appear attractive may not be viable in certain areas in Queensland. For example, commercial forestry is largely dependent on rainfall and soil types. Only a limited area within Queensland will have suitable conditions to support viable commercial forests and plantations.

What costs are associated with carbon sink activities?

The potential costs associated with carbon sink activities should be considered in any evaluation. As a guide, rural landholders could be subject to costs for:

- plantation or sink establishment and management—such as costs associated with site and soil preparation, tree planting, weed management, and maintenance of records
- registration of carbon credit agreements on land title—the agreement and subject area must be determined and registered on the land title
- insurance—against any damages to, or loss of, the carbon sink



- net emissions from the sink—a sink owner may need to purchase permits or credits to offset emissions in cases where the emissions from the sink exceed the carbon sequestered during a particular Kyoto commitment period. For example, net emissions may occur when Kyoto forests are harvested, or if forest loss occurs from natural causes such as fire and pests
- carbon measurement and verification—the amount of carbon sequestered from sink activities will need to be measured and reported on a regular basis, using accepted Australian or international standards. Measurements might be done by the sink owner or by a specialist consultant, depending on the complexity. The methods used and volumes of carbon credited would also require verification by an accredited agency
- transfer of credits—credit transfer or transaction costs may be encountered when a carbon sink owner needs to transfer the ownership of the credit to another party, such as a company requiring an emissions offset, a carbon pool manager, or a central trading exchange.

Will carbon farming be profitable?

Recent estimates indicate that farming trees for carbon credits **alone** is not profitable. Even where ideal plantation forestry investment conditions exist, the return from carbon credits may be only marginal, especially given current price estimates.

The Land and Water Resources Research Development Corporation (LWRRDC) has undertaken an economic analysis of how carbon trading may affect financial returns from various forestry, agricultural and land management practices. The paper, *Greenhouse, Carbon Trading and Land Management*, shows that depending on the location, land cost, rainfall and agricultural land use, outcomes from carbon farming may range from small profit margins in addition to returns for timber, to situations where carbon farming cannot compete with cropping or sheep and cattle operations.

How can forestry managers avoid net emissions?

To avoid net emissions from Kyoto forests, the forest manager could maintain a constant pool of sequestered carbon over a Kyoto commitment period, by balancing harvesting and new plantings so that new sequestration always equalled or exceeded any emissions from harvesting. This would avoid net emissions and the associated costs. In years where harvesting was required to exceed growth (e.g. when additional income from the forest resource was needed), permits or carbon credits could be obtained to cover the emissions.

Can small farms be included?

While small farms can be included, there is a risk that the costs of establishing carbon sinks and accounting for credits could outweigh the benefits of participation in the scheme. This issue is particularly relevant in Queensland where there are a large number of small properties on which trees could be planted.

A potential solution to this problem is pooling the carbon sequestered from small operations to generate a large pool of carbon from which credits could be issued. A designated carbon pool manager could be responsible for issuing credits, removing the need for small landholders to be involved in credit transactions. Forestry cooperatives may also assist with reducing planting costs, marketing timber products, and managing risks.

How soon should forests be planted to earn credits?

If commercial forests are established to earn credits, new plantings must occur within the next few years in order to gain maximum value for the credits. This is because the focus of interest is in carbon sequestered during 2008–2012 (i.e. the first Kyoto commitment period), and forests do not begin to sequester carbon in substantial amounts until around 8 to 10 years in age.

What are the uncertainties and risks?

There are substantial risks and uncertainties associated with early carbon credit trading. Possibilities include the following:

- the Kyoto Protocol may not enter into force
- early trades may not meet Kyoto rules and standards for carbon credits
- restrictions could be placed on trading carbon credits
- amounts of carbon traded may be more than the actual carbon sequestered, depending on the rules adopted for measuring carbon.

Other unresolved issues are that:

- the Commonwealth Government has made no commitment to establish an emissions trading scheme, or decided whether a scheme would include carbon credits
- there is no formal Government mechanism at present to recognise current carbon credit trades
- where a sink owner has created a carbon credit and sold them to another party, the sink must be protected, thereby restricting the future use of land (unless sufficient credits are repurchased)
- 'carbon rights' are not specifically recognised in Queensland law (although this is being addressed).

5 Government roles in facilitating carbon credit trading

International developments

The sixth Conference of Parties (COP6) to the United Framework Convention on Climate Change (UNFCCC) was held in The Hague in late November 2000. Parties failed to achieve agreement on key issues to implement the Kyoto Protocol while preserving its environmental integrity. Negotiations were suspended to resume in mid 2001. Discussions are continuing and there is cautious optimism that the Parties will be able to reach consensus on outstanding points, including those relating to the role of sinks and rules for emissions trading, when COP6 resumes.

Commonwealth Government

It is hoped that many important carbon sink issues affecting the potential for carbon credit trading will be resolved in the near future through ongoing international negotiations about the implementation of the Kyoto Protocol. Key decisions to be made include how existing carbon sinks are to be defined and measured, which additional sink activities are to be included, and the extent to which these can be used to meet Kyoto targets. The Commonwealth Government is responsible for negotiating the recognition of sink activities which could be undertaken in Australia to earn carbon credits.

Possible options for a national emissions trading scheme, including carbon credit trading, are under investigation by the Commonwealth Government.

Many programs initiated by the Commonwealth are aimed at developing carbon sinks, and some of these may earn carbon credits if an emissions trading system is established. Relevant programs include Bush for Greenhouse, Plantations for Australia: the 2020 Vision, farm forestry, bushcare and landcare. State Government agencies also have a key role in implementing these programs.

Queensland Government

The Queensland Government is undertaking a range of activities to facilitate establishment of plantations and the legal recognition of rights to sequestered carbon (which may generate carbon credits under a future emissions trading system). The Government is working towards legislative amendments to allow separate ownership of timber harvesting rights and carbon rights in a stand of trees, and registration of carbon sequestration agreements

on land title. Queensland Government agencies are also involved in research to develop a national standard for measuring carbon sequestration.

The Government is supportive of investment in forestry and provides facilitation services to parties investigating and investing in forestry projects in the State. Education and extension services are also provided to rural landholders for forest establishment and management, agricultural production and environmental restoration.

Further information

Carbon sinks and carbon sequestration

Australian Greenhouse Office:
www.greenhouse.gov.au/sinks/

Greenhouse Sinks and the Kyoto Protocol: An Issues Paper:
www.greenhouse.gov.au/pubs/internationalsinks/

Emissions trading

Australian Greenhouse Office:
www.greenhouse.gov.au/emissionstrading/

Carbon credit trading systems

Carbon Trading Market (Sydney Futures Exchange):
www.carbontrading.com.au

New South Wales State Forests:
www.forest.nsw.gov.au/Frames/f_carbon.htm

Financial implications of carbon farming in rural areas

Land and Water Resources Research Development Corporation paper *Greenhouse, Carbon Trading and Land Management:*
www.lwrrdc.gov.au/publicat/op2399/op2399.html

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