

Carbon farming & nature repair markets

Benefits, opportunities and risks for Queensland

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In brief

There are growing opportunities for Queensland land managers and farmers to receive payments for carbon abatement, biodiversity conservation, reef water quality improvements and other environmental services through sustainable land management practices under market-based schemes. This brief provides an overview and update on recent developments to environmental markets in Australia and Queensland, and what the potential risks and unique opportunities are for Queensland.



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Since 2022, there have been significant developments in Australia's carbon and environmental markets, following the review of the Australian Carbon Credit Unit (ACCU) Scheme (formerly the Emissions Reduction Fund), reforms to the Safeguard Mechanism and new legislation to establish a national Nature Repair Market. In this brief, we provide an update of environmental markets in Australia and in Queensland, including the ACCU Scheme, Land Restoration Fund, Reef Credit Scheme as well as the forthcoming Nature Repair Market.

We consider the drivers in demand from increased regulation and voluntary buyers, as well as emerging project opportunities, such as blue carbon and integrated methods. We explain what this means for developers and participants of carbon and environmental offset projects, including the opportunities and risks.

Carbon offsets will play an important role if Australia and Queensland are to meet our net-zero 2050 and interim emissions reductions targets. Recent policy changes and regulatory reforms both domestically and abroad are creating an increased demand for high-integrity carbon and other types of environmental credits.

Queensland's significant biophysical potential in its land and marine ecosystems coupled with its well-credentialed policy settings is well placed to take advantage of these opportunities. In fact, it's been estimated that Queensland is able to generate six-fold more carbon credits than NSW and five-fold more than WA.

Here we explore what's involve and some of the risks and benefits for project participants in the land sector.

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What are environmental markets?

Environmental markets put a financial value on environmental benefits, also known as 'ecosystem services'. For example, an increase in the amount of carbon stored or a reduced amount of nitrogen that would otherwise be released into waterways through better land management practices. A quantifiable amount of an environmental benefit (e.g. one tonne of carbon abated, or one kg of nitrogen abated) is issued with a certificate (or 'credit') that can be traded, via a market, to buyers. Credits are issued either by government or a regulatory body to the providers that deliver such environmental benefits through approved projects. These credits are purchased by organisations who are mandated by regulation to offset the impact of their organisation's activities or those that voluntarily choose to improve their sustainability, for example companies that commit to carbon neutrality (see Box 3 for more information).

Until recently, Australia's only regulated market was the Australian Carbon Credit Unit (ACCU) Scheme (previously known as the Emissions Reductions Fund). The Federal Government is soon to introduce a voluntary biodiversity market, the Nature Repair Market, designed to improve and repair natural environments. In Queensland, the Land Restoration Fund is an overlay to the ACCU Scheme, paying a premium for carbon credits generated by projects that can demonstrate additional social and/or environmental co-benefits. Queensland has also introduced the Reef Credit Scheme, which provides credits for projects that reduce nutrient runoff to improve water quality of the Great Barrier Reef, and the Cassowary Credits scheme, which provides credits for habitat restoration activities.

The ACCU Scheme

The ACCU Scheme,¹ is Australia's primary and only regulated carbon market. Under the scheme, one Australian Carbon Credit Unit (ACCU) is issued to registered project proponents of carbon projects for every one tonne of carbon abated.






How are ACCUs created?

ACCUs are created through carbon projects that either avoid emissions or store additional carbon long-term. Carbon projects must be registered through the Clean Energy Regulator and use an approved method. Methods relate to the types of activities or land management practices that can be undertaken and the ways in which carbon abatement is measured and reported.

Carbon projects can be developed and managed by landholders, graziers, farmers, or local councils, but are often developed by specialist firms (carbon service providers) that help to manage projects that bring multiple sources of carbon abatement or sequestration to the market to sell to third parties, with an objective of reducing transaction costs. Carbon service providers negotiate with carbon rights holders directly and in some instances assume the role of project proponent.

In practice, most of the projects applicable to the land sector are sequestration projects, while many of the carbon avoidance projects relate to other industries.

Figure 1: Types of environmental markets available in Queensland.

	 ACCU Scheme	 Land Restoration Fund (LRF)	 Nature Repair Market	 Reef Credit Scheme	 Cassowary Credits
Market	Carbon	Carbon + co-benefits	Biodiversity	Water quality	Threatened species
Jurisdiction	National	Queensland	National	Queensland	Queensland
Credit issue	1 ACCU = 1 tonne carbon abated	ACCU + premium for co-benefits	1 certificate issued & valued per project	1 reef credit = 1kg nitrogen abated	1 cassowary credit = improvement in rainforest condition
Buyers	Regulated (i.e. Safeguard Facilities) + voluntary	Voluntary	Voluntary	Voluntary	Voluntary



Carbon projects and the methods that underpin them must demonstrate the following three criteria:

1. **Additionality** – the project must create a new activity for reducing emissions as opposed to an existing activity or an activity required by law. In essence, the project must provide a carbon benefit that would not have happened without the market.
2. **No leakage** – the project must not cause emissions to be released elsewhere in the economy, for example, by diverting organic waste from a landfill site, but having it decompose elsewhere or avoiding land clearing on a part of a property designated as the project area, while clearing more land on another area.
3. **Permanence** – for projects that store carbon in vegetation, soil, geological reservoirs or other sinks, permanence is a requirement to maintain the carbon stored or sequestered by a project for a set period of time. This is essential as CO₂ persists in the atmosphere well in excess of 100 years following its release. While a 100-year permanence period is the gold standard, some methods enable proponents to opt for a permanence period of 25 years, but for a reduced number of ACCUs to the 100-year timeframe.

Types of carbon farming projects (methods)

There are several different methods that have been developed for carbon farming including:

- beef – herd improvement, feeding nitrates
- soil carbon
- irrigated cotton
- dairy – destruction of methane, dietary additives
- vegetation – reforestation, revegetation, protecting native forests
- tidal restoration of blue carbon ecosystems
- savannah fire management.

New methods and reforms to the ACCU Scheme

Following an Independent Review of Australian Carbon Credit Units (ACCU), led by Professor Ian Chubb AC, there are a number of proposed reforms to method development and to the ACCU Scheme.

One of the rationales behind reforms is to reduce the risk to project proponents by enabling more carbon credits to be captured under the one project.

Most notably, the development of new ACCU methods which was previously developed and prioritised by the Australian Government is now open to proponents. This will provide more flexibility to develop new approaches to abatement. The rationale underpinning this change

is that proponent-led methods will promote innovation and increase the speed of method development by drawing on landholder knowledge.

While the Commonwealth progresses legislative reforms to implement the recommendations of the Chubb Review, an interim process for assessing new methods has been put in place, where proponents are to submit an Expression of Interest (EOI) that will be assessed by the Emissions Reductions Assurance Committee against legislated Offsets Integrity Standards (OIS) who will make recommendations to the Minister about which methods should be approved.

Newer methods becoming available under the existing ACCU Scheme include the first 'Blue Carbon' method (e.g. carbon stored in aquatic environments) and an Integrated Farm and Land Management Method.

Blue Carbon methods

Under this method, the net abatement amount (the amount used for crediting ACCUs) for a project will be the summed change in carbon stored by a project compared to the previous crediting report (or relative to the baseline for the first reporting period), and the emissions avoided relative to the baseline, for each carbon estimation area (CEA). This calculation will also need to account for any increases in emissions resulting from the project, including:

- any direct impacts on forests and vegetation due to the introduction of tidal flows
- fuel used for the operation of heavy machinery when carrying out project activities
- soil disturbance because of excavation activities.

There is currently only one approved blue carbon method, the Tidal Restoration of Blue Carbon Ecosystem Method. This method allows project proponents to earn ACCUs by reintroducing tidal flow (for instance, by removing seawalls) to coastal wetlands.²

Integrated Farm and Land Management Method

This method will allow different activities for reducing emissions on agricultural land to be combined (or stacked) into a single method. Existing agricultural methods such as soil sequestration, vegetation sequestration and the expired Human-Induced Regeneration Method will be combined. The timeline for completion indicates that if approved this method may be available as early as June 2024.³

The ACCU scheme review has recommended that methodologies be proponent driven rather than government driven. This will mean that landholder knowledge can be used to inform projects in the future.

Who buys ACCUs?

The historical price of ACCUs has varied between \$20-\$60 a tonne (Figure 2). The main buyers of ACCUs are governments, regulated Safeguard Facilities⁴ that fall under the Safeguard Mechanism and voluntary buyers. Governments have traditionally been a key purchaser of ACCUs in order to create market demand and achieve policy outcomes. Increasingly, however, ACCUs are being purchased by the private sector, including:

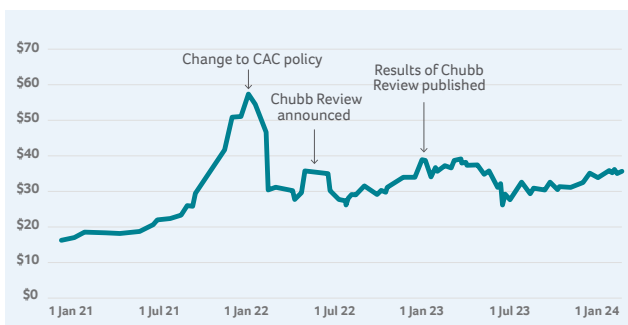
Compliance buyers: Since 2016, facilities that emit more than 100,000 tonnes of CO₂e (known as Safeguard Facilities) have been mandated to reduce their emissions under the Safeguard Mechanism. Until recently, Safeguard Facilities could apply for extensions from the Minister which were often granted, however, following a review of the scheme, reforms in 2023 have seen a tightening of the Safeguard Mechanism. As at 2023, Australia's 219 largest emitters are obliged to reduce emissions by 4.9% per annum against the organisation's benchmark or incur financial penalties (see Box 1).

Voluntary buyers: beyond regulation, many corporations are making net-zero commitments and participating in programs such as the Federal government's Climate Active program to improve social licence or to get ahead of future regulations. There has been a trend of increasing demand in voluntary carbon markets with voluntary cancellations making up the majority of non-Commonwealth ACCU cancellations (1 million in 2023).^{5,6}

International buyers: ACCUs can also be purchased and sold internationally. Article 6 of the Paris Agreement has been instrumental in driving international demand, as it sets the rules for international carbon trading and the ways that countries to cooperate with each other to reach their climate targets). Entities need an Australian National Registry of Emissions Units account if they wish to own, transfer or surrender ACCUs. There are, however, other cheaper options for international purchasers of carbon credits which could impact international demand for ACCUs, such as those through voluntary standards and the Clean Development Mechanism (CDM).

The Clean Energy Regulator (CER) is in the process of developing an Australian Carbon Exchange to support more efficient trading of ACCUs to private entities.

Figure 2. ACCU spot price 2021–2024



Box 1

How reforms to the Safeguard Mechanism create demand for ACCUs

In 2023, the Australian Government passed legislation to support increased carbon reduction targets. This included a 43% reduction of emissions from 2005 levels by 2030 and net zero emissions by 2050. This legislation was supported by reforms to the Safeguard Mechanism that requires all Safeguard Facilities to meet increased emissions reduction targets starting from 2023. Reforms to the Safeguard Mechanism will require steep declines in emissions between now and 2030. The ability for Safeguard Facilities to reduce emissions to meet these targets varies between different industries. Of the 215 Safeguard Facilities, there are 90 mining companies. The Minerals Council of Australia has suggested that without access to carbon credits (in the form of ACCUs), the mining sector would be unable to meet their emissions reductions obligations.

Approximately 200 million tonnes of net CO₂ emissions reductions are needed in Australia by 2030 for legislative targets to be met. It is anticipated that much of these emissions reductions will be achieved through offset projects until technologies and renewable infrastructure becomes widely available and affordable. This means there are opportunities and challenges for industry and landholders in Queensland to support these net emissions reductions targets both now and in the future.

This regulation-driven demand is good for providers of ACCUs, as it creates greater market certainty. However, future reforms that could weaken the Safeguard Mechanism cannot be ruled out. Beside ACCUs the only other form of offsets available to Safeguard Facilities are Safeguard Mechanism Credits (SMCs). SMCs are certificates issued to Safeguard facilities that reduce emissions above the 4.9% annual targets. Facilities can bank SMCs for use in later years but may also trade them with other Safeguard Facilities.



Nature Repair Market

The *Nature Repair Act 2023* (Cth) came into effect in December 2023, establishing the framework for the Nature Repair Market. This voluntary national market rewards landholders for protecting, improving or restoring ecosystems, offering a means for private investment to incentivise practice change.

Landholders who undertake an approved project under the scheme will be issued one tradable certificate for the entire project which will be listed on a public register. The Act has aimed to align the Nature Repair Market with the *Carbon Credits (Carbon Farming Initiative) Act 2011*. Alignment between the carbon and nature markets will help encourage investments in land sector carbon projects deliver biodiversity co-benefits.

The Act supports a flexible approach to project development, and allows for determinations of different methods. Methodologies need to include:

- the eligibility conditions that must be met for a project covered by the method to be registered and for a biodiversity certificate to be issued in respect of the project
- the activities that are to be carried out, or that are not to be carried out, for the purposes of the project
- information on how the activity period for the project and the permanence period for the project, will be worked out. The permanence period would cover the life of the project. A project would have either a 25-year or a 100-year permanence period, unless a different period is provided for in the applicable method
- conditions and requirements relating to the measurement and assessment of the protection or enhancement of biodiversity.

Unlike schemes which issue one credit for a given quantity of pollutant avoided, biodiversity projects under the Nature Repair Market will receive just one certificate issued by the regulator, the price of which will be negotiated between buyers and sellers according to the improvement in natural capital value. Importantly, certificates cannot be used to offset any environmental harm elsewhere (which was a result of political negotiations during the bill's debate). These two features will drive some uncertainty in the market.

Biodiversity projects can be carried out on private lands – areas of land or waters that are exclusive possession or non-exclusive possession native title areas, as well as Crown and Torrens system lands (system of land title registration in Australia); and in or on relevant Australian waters (both onshore and offshore), including lakes, rivers, and marine and coastal environments.

Land Restoration Fund

The Queensland Government Land Restoration Fund is a \$500 million investment and the largest sub-national investment program. It is designed to support conservation outcomes along with providing Queensland landholders the opportunity for income diversification through carbon offset projects. The fund covers a wide range of carbon farming activities that are suited to all local areas of Queensland. The fund will target and pay for projects that provide additional benefits beyond carbon. Project proponents use a standard framework to measure and verify the change in environmental condition.

Queensland's primary land use is primary industries, with agriculture occupying over 88% of the State.⁷ 8.24% of Queensland land is protected.⁸ This means that vegetation management, agricultural stewardship, and private/public partnerships are of vital importance with respect to biodiversity conservation in Queensland.

The Land Restoration fund, along with purchasing credits that support co-benefits, is used to assist in overcoming barriers to participation in the carbon market for Queensland project proponents and offers a unique opportunity in this respect.

The Reef Credit Scheme

The Queensland Government Reef Credit Scheme is a voluntary scheme designed to improve water quality in the Great Barrier Reef catchment. Unlike ACCUs which must be based on CO₂e reduction, the scheme offers more flexibility such that Reef Credits can be issued for reductions of different types of pollutants that results in an improvement in water quality and methods can be proponent led. Under approved and proposed methods as at 2024, one Reef Credit is generated for each kilogram of dissolved inorganic nitrogen or for 538 kg of fine sediment that has been prevented from reaching the Reef. Methods for other pollutants such as pesticides and herbicides may become available.

There is no set price for reef credits, as the cost is negotiated between buyer and seller in each transaction. This leads to some uncertainty for market participants as the benefits of a project may not be known until it is completed. The intention of the Reef Credit Scheme is not to support a cap and trade approach in the catchment, as this could be problematic in terms of offsetting like for like activities. Rather, Reef Credits are a type of green bond scheme where farmers can be awarded credits for activities that improve water quality, and then sell those credits to government or private industry.⁹



Cassowary Credits Scheme

The Cassowary Credits Scheme is a new scheme that has been developed for the Wet Tropics region in Queensland. Terrain NRM led the development of the scheme, in collaboration with government, indigenous groups, industry and scientific experts. Through the scheme, landholders and managers will be paid for projects that have a measurable benefit on the landscape through habitat restoration activities.

Like the Reef Credit Scheme, the Cassowary Credit Scheme is not underpinned by regulations in terms of generating demand, as the credits cannot be used to offset any regulatory requirement. Demand for the scheme will come from philanthropists, and government grant programs. The scheme is expected to attract investment internationally through the objective to pay only for 'quantifiable contribution to rainforest habitat improvement'. However, it is limited in area to Far North Queensland, and will target only land that is not viable for agriculture.¹⁰

Considerations for land managers

What are the opportunities and benefits?

The different markets described above provide a number of opportunities and benefits, both for project proponents and for environmental protection (that they are each designed to address).

Diversified income and opportunities to generate more credits

Carbon and biodiversity projects can provide an additional income stream for farmers and graziers, first nations groups, land managers and councils. Demand for high integrity offsets is projected to be high in the short term (i.e. to 2030) but may decline in the long-term as more technologies become available and renewables come online to help businesses decarbonise. There are also opportunities for 'credit stacking' which involves receiving multiple payments under the one project (see Box 2). There are also new methods about to be released and in development that could see many more ACCUs generated from one project.

Box 2

Credit Stacking

The phrase 'stacking credits' makes reference to multiple credits generated from one project being sold separately.¹⁷ There is some concern in the literature that 'double-dipping' can occur as a result of only one practice change.¹⁸ However, stacking of credits can be justified where a project has multiple benefits, and accommodating this can incentivise positive changes in land management and potentially lead to cumulative benefits.¹⁹

An associated phenomenon is bundling of credit units. This refers to when multiple ecosystem services are combined to be sold as a 'bundled credit', resulting in a higher price for the credit but an inability to sell it separately.²⁰ The Land Restoration Fund is a type of bundled credit.

These occurrences present both opportunities and challenges. For instance, stacking may be used to protect an ecosystem through the protection of its various valuable functions and services.²¹ However, stacking can also be seen as a potential threat to the legitimacy of a market approach to carbon sequestration and biodiversity conservation.²² For this reason, any schemes that have been designed to allow for bundling and stacking of credits must be designed carefully to achieve the desired ecological outcomes.²³

Note, however, that stacking credits/certificates may result in 'stacked' risks. Although, it may be possible to achieve positive carbon and biodiversity outcomes with the same practice change, the requirements for monitoring, reporting and verification may differ between the different markets a proponent elects to participate within. Although bundling of ecosystem services to generate a premium on a credit may not bring entirely dual requirements, proponents could still expect to be required to demonstrate the co-benefits generated by a project.





Integrity assurance and reforms to the ACCU scheme creates more certainty of demand:

Recent reforms to the ACCU Scheme as well as national and global actions to crack down on greenwashing and expose poorly run schemes mean that carbon credits with high integrity will be in greater demand and demand a higher price. While there have been criticisms of the integrity of carbon credits and whether they do what they say, the recent Independent Review of Australian carbon credit units (ACCU) concluded that the ACCU scheme is fundamentally well-designed but recommended a number of ways it could be strengthened.

Improved land resilience

Agriculture in Queensland will face climate risk through changes in weather patterns and extreme weather events. Approved projects that foster sustainable land management practices can increase resilience to increasing climate-induced floods and droughts.

What are the risks and drawbacks?

Financial risks

All carbon and environmental projects come with a degree of risk. Financial risks can include: high establishment costs (e.g. baseline measurements, professional advice), failure of projects to meet permanence obligations, policy uncertainty and price volatility. Further, where carbon is not sequestered as expected, ACCUs will not be issued. This can mean costs can be incurred without a financial reward. There are potential financial risks for scheme participation. Enterprises engaged in carbon abatement initiatives selling their ACCUs at prices below the genuine cost of emissions reductions or investing in significant changes to practices and not recovering the costs. Farm and business operators may also need to ensure that carbon projects do not reduce revenues from their normal operations, e.g. lower crop yields from changes in farming practices. There are risks in terms of the demand for credits. In particular, there has been extensive modelling on the amount of credits that will need to be generated to meet the requirements imposed by the reformed Safeguard Mechanism.¹¹ Where there is high demand to meet Safeguard Mechanism requirements, the price of credits may be assured in the short term. However, the integrity of the credits will be critical to ensure emissions reductions are genuine.

Demand uncertainty

For entirely voluntary markets such as Reef Credit Scheme and the Cassowary Credit Schemes, there is no regulatory-driven demand for the purchase of credits. This is known as an incomplete market, where

project proponents will necessarily rely on philanthropic investment and government grant funding. The price of the credits generated through these schemes could therefore be low unless it is inflated through government intervention. This introduces an element of risk to participants but at the same time, will not change the need for schemes to have environmental integrity.

Project implementation

Concerns have been raised about the integrity of some approved project methods and whether those methodologies lead or will lead to the amount of carbon sequestered to the extent that is claimed. This may result in changes to standards and methodologies which could create unforeseen complications or additional costs for existing projects. However, if a method is varied or replaced by a new method during that crediting period, a project proponent can choose whether to move to the new or varied method or remain with the current method being implemented.¹² While this provides a level of certainty for project proponents, it may mean some projects may be supported by questionable methodologies.

Socio-economic impacts

There are some social risks that have been linked to ACCU Scheme participation. In particular, there are risks that agricultural enterprises will make significant changes to accommodate carbon sequestration and therefore require different skills on farm. This could mean that less people are needed to manage properties, or in some cases allowing farms to be remotely managed. This can have both a short and long term impact on the number of people within communities and as a result negatively impact small businesses and other services available within those communities.¹³

Future compliance obligations

Participants in the Australian agricultural industry will be likely to require ACCUs – or equivalent – to enable climate abatement and mitigation for the sector. The pressure to reduce emissions already exists through targets set by agricultural industry bodies. In the future, emissions reductions may be mandated to access key international markets.¹⁴ If large volumes of ACCUs are sold as industrial emissions offsets to Safeguard Facilities, least cost abatement opportunities for agriculture and land managers may be lost.¹⁵ Meeting agricultural emissions reductions targets (either mandated or encouraged) may require significant investment in new technology, practices, or infrastructure. Where these costs are imposed on agricultural facilities there may be financial uncertainty for farmers. This is especially the case if these investments do not yield immediate financial returns.¹⁶

How do carbon and other environmental markets work?

Market based instruments (MBIs) are policy tools used by governments designed to achieve a policy goal by providing a financial incentive for actors to take actions they wouldn't otherwise take. A market scheme is an example of a MBI and is defined as 'a decentralised collection of buyers and sellers whose interactions determine the allocation of a good or set of goods through exchange'. This can include a broad range of instruments that can ultimately provide an incentive or a disincentive to bring about certain outcomes.

The phrase 'environmental markets' refers to frameworks that quantify and marketise previously unpriced benefits associated with natural capital (or nature) and the ecosystem services it provides. Generally, environmental markets are concerned with the intangible characteristics of natural capital – the ecosystem services provided by the natural capital and integrity of the ecosystems, such as carbon sequestration, regulating pollutants, and flood control as examples.

Environmental markets may take a number of forms and may adapt in response to market pressures. In any market there is both supply and demand that are driven by different regulatory elements. Often markets are created as incomplete markets, which means that the demand for market instruments will predominately come from voluntary purchasers and government. Indeed, governments have a crucial role to play within them. As Keohane and Olmstead articulate:

'Many environmental problems would be alleviated if proper markets existed. Since those markets don't arise by themselves ... governments have a crucial role in setting them up – or in creating price signals that mimic the incentives a market would provide.'

In Australia environmental markets are generally incomplete, however the recent amendments to the Safeguard mechanism (a baseline and credit system) will lead to ACCU demand from Safeguard Facilities. Facilities will be able to purchase ACCUs to meet their baseline requirements (and up to 30% can be used without needing to explain their use - in lieu of emissions reductions - to the Regulator).

References and endnotes

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- 20 Torabi and Bekessy (n 22) 85. apart from a few certification standards in the voluntary market, little genuine action has eventuated, but actors in these markets are continuing to examine the idea of combining carbon and biodiversity credits. This paper provides the first empirical analysis of the opportunities and barriers of bundling and stacking carbon and biodiversity credits as articulated by policymakers and academics, in Australia. Corporate social responsibility (CSR
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